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NO. 1 VOL. 5

UNITED STATES NAVAL MEDICAL BULLETIN

FOR THE

INFORMATION OF THE MEDICAL DEPARTMENT OF THE SERVICE

LIMITED TO PROFESSIONAL MATTERS AS OBSERVED BY MEDICAL OFFICERS AT STATIONS AND ON BOARD SHIPS IN EVERY PART OF THE WORLD, AND PERTAINING TO THE PHYSICAL WELFARE OF THE NAVAL PERSONNEL

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TRUMAN H. NEWBERRY,
Acting Secretary.

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PREFACE.

The publication and issue of a quarterly bulletin by the Bureau of Medicine and Surgery contemplates the timely distribution of such information as is deemed of value to the medical officers and the hospital corps in the performance of their duties, and with the ultimate object that both shall continue to advance in proficiency in respect to all of their responsibilities.

It is proposed that the Naval Medical Bulletin shall embody matters relating to hygiene, tropical and preventive medicine, pathology, laboratory suggestions, chemistry and pharmacy, advanced therapeutics, surgery, medical department organization for battle, and all other matters of more or less professional interest and importance under the conditions peculiar to the service and pertaining to the physical welfare of the naval personnel.

It is believed that the corps as a whole should profit, to the good of the service, out of the experience and observations of the individual. There are many excellent special reports and notes beyond the scope of my annual report being sent in from stations and ships, and by communicating the information they contain (either in their entirety or in part, as extracts) throughout the service, not only will they be employed to some purposes as merited, but all medical officers will thus be brought into closer professional intercourse and be offered a means to keep abreast of the times.

Special attention will be given by the instructors of the Naval Medical School to the review of advances in medical science of special professional interest to the service, as published in foreign and home journals, and extracts from these will appear in the bulletin, together with such remarks as the instructors may deem of value to officers on foreign service or sea duty.

Information received from all sources will be used, and the bureau extends an invitation to medical officers to prepare and forward, with a view to publication, matter on subjects relating to the profession in any of its allied branches.

C. F. Stokes,
Surgeon-General United States Navy.

SPECIAL ARTICLES.

DIPHTHERIA PROPHYLAXIS IN THE NAVY.

By Surg. CHARLES S. BUTLER, United States Navy.

The purpose of this paper is not in any manner to discourage the use of diphtheria antitoxin as a curative measure. On the contrary, it should be distinctly emphasized that no therapeutic agent at our command has proven more thoroughly its great worth than has diphtheria antitoxin in lowering the death rate in this disease. There are some points, however, as to its prophylactic use which it is deemed advisable to review, with the idea of pointing out wherein antitoxin prophylaxis in the Navy presents a different aspect from antitoxin prophylaxis in a school where there may be a large number of children who, in the very nature of things, can not be kept under strict medical supervision.

It is generally recognized to be true and is specifically stated by most authorities that susceptibility to diphtheria decreases after the tenth year, so that even in the case of the youngest enlistments in the Navy the susceptible age is long since passed. "The blood serum of many individuals, usually adults, who have never had diphtheria often has a slight general antitoxic property." (Park.)

Clinically and bacteriologically diphtheria is one of the easiest of all diseases to recognize. If the membrane and other local signs are not in evidence to aid in making the diagnosis clinically, then by smears and culture the organism can be demonstrated bacteriologically. In a considerable proportion of cases the disease can be diagnosticated by means of smears from the exudate stained with Löffler's methylene blue or, if not thus, then they can be demonstrated in 18 hours' growth on Löffler's blood serum. In the Navy the crews of ships and the enlisted personnel at shore stations are constantly under the eye of the medical officer. It is unlikely that the primary case of diphtheria on shipboard would go more than a few hours without being detected. From the moment the primary case is detected everyone else on board is a suspect, and subsequent frank cases would not go long undiagnosticated. The mortality among cases of diphtheria treated with large doses of antitoxin during the first day of the disease is practically *nil*. Thus, while diphtheria is responsible for considerable morbidity in the Navy (4.25 per 1,000, average for 10 years, 1895–1905), the death rate has been for the

same period only 0.041 per 1,000 strength. This is due, most likely, to the early diagnosis and prompt antitoxin treatment.

Character of immunity.—The immunity conferred by the introduction of diphtheria antitoxin into the human organism is a passive immunity, and stands as the purest type of this form of immunity. The cells of the body take no part in the formation of the antisubstance which is simply conferred upon the organism, having been previously created in the horse, and is therefore evanescent in its effect. It is excreted rather more slowly, to be sure, but in the same manner as any other medicament. The antisubstance reaches its highest concentration in the blood stream of the inoculated individual about 24 hours after the hypodermic inoculation. Thereafter it at first rapidly and then more slowly decreases, until after a period of about 21 days no trace of it remains. It seems to be the opinion of some physicians that the antitoxin destroys the diphtheria bacillus and hence sterilizes the seat of infection. Nothing is further from the truth. No bacterial destruction takes place. It is not an antibacterial immunity, but an antitoxic one, and acts simply by neutralizing the poison generated and absorbed; much as an alkali neutralizes an acid. It thus, for the time being, robs the bacillus of its lethal power. The sterilization is accomplished in untreated cases by other and not-well-understood tissue reactions. Perhaps the absorption of some few diphtheria bacilli (auto-vaccination) eventuates in the production of an amboceptor and we thus get bacteriolysis and sterilization, or perhaps the specific opsonin is increased so that finally the phagocytes can overcome the bacteria at the seat of infection. Very likely both of these reactions are operative. At any rate the subsidence of symptoms (or their prevention) after the introduction of antitoxin is dependent upon different substances from those which accomplish the sterilization, and it is certain that the latter substances are not generated by the introduction of antitoxin. These facts are brought home to us when we recall the pains we are often put to in sterilizing a throat containing virulent bacilli long after the symptoms have passed away, and, further, when we remember that antitoxic serum forms a good culture medium for *B. diphtheriæ.*

It is a fact that only a small percentage of individuals who harbor diphtheria-like bacilli develop symptoms of diphtheria. About 3 per cent of people show upon bacteriological examination of the nasal and faucial secretion the presence of organisms of this class. When a case of diphtheria appears on board ship and it is later found that others on board harbor these bacilli we are tempted to attribute these "latent infections" to the frank case, whereas the latter may have contracted the infection from a bacillus carrier and manifested symptoms only because of his peculiar constitutional state.

board ship it is impossible to state just who among the enlisted personnel should be considered a suspect. What with [common] drinking cups, eating utensils, and the close personal contact, the chance for infection is practically universal. To set aside a certain number of men and say that they should take a prophylactic dose of diphtheria antitoxin is to leave the remainder of the crew in a condition exactly as bad as if nothing at all were done. So that in order to give prophylactic doses consistently and effectively, it is necessary to immunize the entire crew. But 3 per cent of them being infected can transmit the disease, and 21 days after the prophylactic dose they all may theoretically manifest symptoms so far as any passive immunity is concerned. Therefore, to be consistent, we must immunize the entire crew every 21 days, which means the immunization of the entire enlisted personnel every 21 days, which is of course absurd. It is about as reasonable to toll off and immunize any particular set of men on board ship when a case of diphtheria appears as it is for a doctor to take an immunizing dose of antitoxin every time he is called to attend a case of diphtheria, or as it would be to immunize the large body of contagious-hospital nurses throughout the United States every 21 days. The sane procedure is to identify carefully the bacillus carrier and treat his focus locally, to make an early diagnosis of the actual case clinically and bacteriologically, and to the latter give large curative doses of antitoxin combined with local treatment and isolation.

Further than this it is a disadvantage to give prophylactic doses of antitoxin, for the reason that it is possible to sensitize the individual inoculated, so that if a second inoculation is required he may manifest untoward or perhaps fatal symptoms. We are all familiar with the fact that in guinea pigs the second injection of horse serum, provided an interval of 12 to 15 days has elapsed, is almost always fatal. In human beings this sensitization usually manifests itself in the shape of a shortened incubation period to the so-called serum disease.

There are two classes of individuals who appear to be sensitive to first injections of horse serum. First, children having the lymphatic constitution, in which class there have been many fatalities from primary injections, and, second, persons who suffer from asthma or are of the asthmatic tendency. The symptoms following injections in the latter class of persons are often exactly like those following second injections in guinea pigs. These symptoms are those of an intensified asthma. Breathing becomes difficult, the face cyanosed, the patient may froth at the mouth and die very quickly, usually within a few minutes. H. F. Gillette has published 30 cases of fatal or almost fatal results following the administration of diphtheria antitoxin, and similar results have been noted in almost every part of the world. The substance responsible is not the antitoxin but

some other body in the horse serum which acts upon an individual who, in some way not understood, has become sensitized to it.

For the following reasons, then, it would seem that antitoxin prophylaxis has no reason to be practiced in the Navy;

First. The crews of ships are constantly under medical supervision.

Second. The immunity produced is only short lived and is not an antibacterial immunity.

Third. There is the possibility of the prophylactic dose sensitizing the patient so that if a second injection were necessary it could cause alarming symptoms or a fatal result.

Fourth. There is always the danger that the injection may be into an asthmatic subject.

Fifth. Antitoxin prophylaxis is costly.

NOTE.—It is hoped that in the near future it will be possible to issue dried-blood serum from the United States Naval Medical School to ships. This would greatly simplify the diagnosis of diphtheria on board ships, as it would make it possible to prepare fresh Löffler's medium at any time instead of having to wait for the receipt of this ready-prepared medium from the Naval Medical School. (See article by Asst. Surg. E. W. Brown in the July Bulletin, Vol. IV, No. 3.)

NOTES ON "606."

By Surg. RAYMOND SPEAR, United States Navy.

Capt. H. J. Nichols, United States Army, who was associated with Ehrlich when he was conducting his experiments with "606" and who has since administered the drug in a number of specific cases, advises the alkaline method of preparation with intramuscular injection.

"606" is an acid powder faintly soluble in cold water and soluble in hot water. The alkaline solution is prepared by putting 0.6 gram of the powder into a glass-stoppered bottle containing glass beads and adding 10 cubic centimeters of hot water. The bottle is then shaken and the powder dissolved. The next step is to render the solution alkaline. This is done by the addition of a normal sodium hydrate solution—it usually takes 0.7 to 0.8 cubic centimeter for each 0.1 gram of the "606" used. The powder during this procedure is precipitated and again dissolved as the solution becomes alkaline. Nichols advises that a small quantity of the powder be left in suspension, as then the alkalinity will be very faint and consequently less pain will be experienced by the patient. The pain increases as the solution becomes more alkaline. No index of the alkalinity of the solution is needed other than the solubility of the powder. Sterile water is added to the solution up to 20 cubic centimeters. The drug is probably most efficiently administered by giving it hypodermically by means of a 10-cubic-centimeter syringe with a long needle deep

into the gluteal muscles at a point above the line drawn from trochanter to tuberosity of each ischium, 10 cubic centimeters on each side. Administering it high into the muscle keeps it away from the nerves and blood vessels as they escape from the pelvis.

Nichols strongly advises against giving the drug subcutaneously after the method of Wechselmann, for the drug often becomes encysted and is not absorbed. It is very painful and often causes abscess formation or the tissues may necrose.

The method of giving the drug in suspension into a muscle is not nearly as satisfactory as the method first described.

Some workers are giving the drug intravenously. In this method the powder is prepared by the alkaline process, the solution is then added to 300 or 400 cubic centimeters of salt solution, and introduced into a vein as would be done in a simple saline transfusion. All traces of the drug so administered leave the body very quickly, probably in three or four days.

Ehrlich at present is using two doses of 0.5 gram at each dose. The first dose is given intravenously and is followed by a second dose one week later, using the alkaline intramuscular method.

Nichols states that he has used 0.8 to 1 gram in young and strong adults without producing untoward symptoms. He, however, cautions against its use in cases of cardiac disease, aneurysms, and advanced cases in which the nervous system is involved.

In a case of severe infection treated by the writer in conjunction with Capt. Nichols, the drug was first administered subcutaneously. A large indurated mass of inflammatory tissue formed around the injected powder which had been given in suspension. The symptoms cleared up but there was a relapse. Five weeks after the first injection a second intramuscular gluteal injection by the alkaline method caused the symptoms to disappear promptly.

The injection as now given is painful, and it is decidedly advisable for the patient to remain in bed for four or five days. The gluteal muscles become indurated and quite tender in some cases. Hot applications by means of hot cloths and hot-water bags give some relief and probably hasten absorption. Morphine is sometimes necessary to relieve the pain.

RECENT DIAGNOSTIC METHODS IN OTOLOGY APPLICABLE TO THE NAVAL SERVICE.

By Passed Asst. Surg. G. B. Tribble, United States Navy.

It is safe to say that no branch of the manifold duties of the naval surgeon is so much neglected as otology. The reasons for this are not far to seek. The imperfect training afforded by a six weeks' course in the senior year in diseases of the ear, prior to graduation,

supplemented by observation of a few radical or more probably simple mastoid operations during his service as an interne, constitutes the training of the greater part of the surgeons of the service in this important subject. After entry into the service the young surgeon is confronted with a number of cases of otitis media of the suppurative type due to causes such as a complication of the infectious fevers, a spreading infection following an external otitis, swimming in infected water, injuries from explosions, high pressure, and one or another of the numerous causes afforded by a service extending from the Tropics to the Frigid Zone and embracing many men from all walks and conditions of life.

The simple examination with the head mirror and aural speculum is sufficient to diagnose the presence of exostoses from the bony or cartilaginous canal, or the presence of inflammation of the external canal, while smears and cultures will demonstrate the cause. Impacted cerumen is extremely frequent and can be easily removed by syringing with hot water or the usual boric acid solution. In case of difficulty a little preliminary softening with bicarbonate of soda solution is of assistance. A pledget of sterile cotton should be left as a dressing for 24 hours.

It often happens that the external canal will be so swollen that it is impossible to get a clear view of the drum. A little cocain and adrenalin solution will be of service in these cases.

After thorough examination of the external canal the drum should be inspected, the normal anatomy being constantly in mind. The presence of blisters on the drum, which are collections of fluid beneath the thin epithelial layer, should be carefully noted, for when these burst spontaneously they simulate a discharge and the case may be diagnosed as an otitis media when it is in reality a myringitis.

In attic suppuration there is often formation of polyps, which protrude through perforations and sometimes conceal them. In the inspection of the drum thorough examination for the presence of perforations should be made. Whether or not there is pus or exudate in the perforation, and the size and location of the perforation, should be noted.

If no perforations are found, the presence or absence of scars and chalk deposits, and in fact any particular in which the ear under examination differs from normal, should be studied.

Unfortunately, the history given by patients in the service is practically of no value. This is not from ignorance, but from selfish motives, some wishing a medical survey, others affected by diseases prior to enlistment wishing to conceal these facts so far as possible. A routine examination of the nose and throat is necessary as well.

It is considered a safe rule in continental hospitals not to operate on cases of acute suppurative otitis media for six weeks, unless com-

plications set in, free drainage being obtained usually by puncture of the membrana tympani in the posterior inferior quadrant, and repeated as often as necessary. With the newer syringes medication can be brought into the antrum and middle ear spaces. Practically all radical operations, and they are the ones of choice in mastoid work, leave a permanent impairment of hearing, often unfitting a man for the service and burdening the Government with a pensioner. The question of the suppurative middle ear conditions, their complications and sequelæ brings us to the point where the greatest progress has been made in the whole realm of surgery. Since the time of Meniere's report of the *post-mortem*, in which he discovered a pathological condition of the labyrinth, it has been generally accepted that the labyrinth has an intimate association with the subject of equilibrium.

For the needs of the service it will be necessary to view the field and see if some method can be devised for a routine examination which is not too cumbersome, which does not require too expensive or delicate apparatus, and which will be comprehensive enough to cover the entire field. To do this I would like to offer the scheme used in the Urbanschitch clinic, which, with a few slight modifications, is adaptable to our needs.

After examination by head mirror and speculum the hearing should be tested as follows:

For conversation use the spoken voice in an ordinary tone, trying one ear, then the other. This test may be direct, or through a tube of sufficient length.

For whispering voice, carry out the test similarly with the whispered voice. An ingenious contrivance has been invented by Privat-Docent Barany for excluding one ear from participation; it is well named "noise apparatus." Its mechanism resembles that of an alarm clock with a speculum attachment, which is placed in one ear and the spring released. So much noise is made in the ear to which it is applied that nothing else is heard, unless by the ear of the opposite side. With this apparatus in one ear, and a tube conducting the voice into the ear under examination, an exact result can be obtained.

The Lucas Dennert Test.—Test the good ear by voice test or whispering. Similarly test poor ear, closing good ear; then close poor ear also; if the hearing remains the same it was due to the good ear.

The subjective symptoms, such as noises, tinnitus aurium, etc., should next be ascertained.

Then the tuning fork tests, for the difference between air and bone conduction, are thoroughly embraced in the following tests, which

should be made with a C_1 and C_4 fork to cover moderately high and moderately low tones.

The Weber Test is made by placing a tuning fork on the vertex. The vibration is heard more distinctly on the diseased side in middle ear affections, but is heard generally over the head when no disease is present.

[If the vibrations are heard better on the unaffected side disease of the perceptive apparatus is considered to be present.]

The Rinne Test is a comparison of the time that the tuning fork is heard in the air, as compared with the time it is heard by bone conduction. In disease of the middle ear, or conducting apparatus, duration of sound is shorter by air than by bone. In disease of the internal ear, or perceiving apparatus, longer by air than by bone. Normally, of course, bone conduction is less than air conduction.

The Schwabach Test is a comparison of normal bone conduction (of the examiner if his conduction is normal) with the bone conduction of the suspected case. In diseases of the middle ear bone conduction is lengthened, in affections of the sound perceiving apparatus the time is shortened.

Highly pitched sounds are heard badly in diseases of the internal ear, but are heard comparatively well in diseases of the middle ear. Low sounds are heard comparatively well in diseases of the internal ear and poorly in diseases of the middle ear.

In the examination of the vestibular apparatus we should inquire as to dizziness, and examine for the presence or absence of spontaneous nystagmus.

Turning nystagmus is produced by placing the patient in a chair so arranged that it can be turned entirely around 10 or 12 times, then stopped suddenly. The mechanism of the production of the nystagmus is more or less complicated, but can be explained briefly as follows:

Anatomically the labyrinth is composed of three canals, called from their shape the semicircular canals. There are also the utricle and saccule, but their consideration is not necessary in this explanation. The bony semicircular canals contain the membranous canals which are filled with endolymph. The perilymph lies between the membranous and bony canals, but plays no part. The three canals, frontal, sagittal, and horizontal, are composed of two parts each, a smooth end and a dilated end or ampulla. Any movement or agitation of the labyrinth causes a current or movement of the endolymph in the plane of the movement. By this current or movement of the endolymph a reflex is produced. A rapid movement, such as turning, causes the fluid to go toward the opposite side. Sudden stopping of the turning causes a reverse movement, but the fluid for a time travels in the direction of the original movement. Movement of the endolymph from the smooth end of the canal toward the

ampulla constitutes the effective movement, producing nystagmus to the same side as the movement.

This is Ewald's law, and holds for the horizontal canal, but does not hold for the sagittal and frontal.

Movement from the ampulla to the smooth end produces nystagmus toward the opposite side, from the smooth end to the ampulla of the canal produces nystagmus toward the same side, so that the action is compound, both sides participating, for when the endolymph moves from the ampulla to the smooth end on one side, on the other side, of course, its direction in the corresponding canal is reversed. Each canal produces nystagmus in its own plane. The horizontal canal produces a nystagmus from side to side, the frontal produces a rotatory nystagmus. To bring the frontal canal into agitation the head of the patient must be bent forward. To produce movement in the sagittal canals the head must be bent to the shoulder. The slow movement of the eyes is the labyrinthine movement, and the quick, jerky return, which is really the one used, is the one produced in response to impulses from the brain.

In the turning test the patient is turned rapidly for 10 or 12 revolutions, then halted suddenly, the nystagmus, its direction, the length of time it persists, and its degree are noted.

The nystagmus is increased by the patient's looking in the direction of the nystagmus. For a nystagmus which is only of sufficient strength to be evident in this test, the term "first degree" is used; if it persists when the patient looks straight ahead it is of the "second degree," while if it persists when he looks in the opposite direction it is of the "third degree."

The application of heat or cold produces the so-called "*caloric nystagmus.*" Its production can be readily understood when the physical action of heat and cold are remembered. In a column of water or other fluid exposed to the action of heat the heated particles rise and the chilled particles sink. This is the same as the action of these agents on the fluid in the membranous canals. The movement of the particles produces a current, and the nystagmus is produced in response.

Heat is introduced by syringing the ear with hot water, preferably from 45° to 50° C., for four or five minutes. To get the reaction with cold water, the syringing is done with water at about 23° C. With hot water the nystagmus produced is toward the same side; with cold water toward the opposite side.

From the canals which produce this action we get a combined rotary and horizontal movement. The extremes of heat and cold are more effective, but produce violent nausea and dizziness. The use of hot or cold water is not applicable to cases with dry perfora-

tions, owing to danger of exciting suppuration. In these cases ether vapor can be used to produce cold and heated air to produce heat.

The nystagmus produced should continue about 30 seconds. For instance, turn to the right 10 or 12 revolutions, stop, nystagmus is to the left lasting 20 to 30 seconds normally, or turn to the left and stop, the nystagmus is to the right. There must be a great difference in time between the sides to make the simple comparison conclusive. The caloric test is applied with the head in a straight position and affects the vertical and horizontal canals. Hence the nystagmus is a combined movement both rotary and from side to side.

Galvanic nystagmus is produced with the anode to the ear. The direction of the nystagmus is away from the anode; with the cathode to the ear nystagmus is toward the cathode. This test also shows whether nerve and muscle react, for if one labyrinth is destroyed the caloric and turning tests do not produce a nystagmus on the side of the lesion, but the galvanic current does.

The fistula symptom can be explained as follows: If the bony capsule of the labyrinth is destroyed, the membranous labyrinth may still be intact, and pressure of air in the tympanic cavity will cause a flow of lymph and a corresponding nystagmus, which is called the "fistula symptom." The compression produces nystagmus to the same side and aspiration to the opposite side. Some few cases show the contrary of this and give the "reverse fistula symptom." It is possible that the fistula symptom may be elicited in cases of loosened or dislocated stapes. If the middle ear space is filled with granulations or cholesteatomatous masses, the fistula symptom can not be elicited, and even the caloric tests will be interfered with.

If the endolymph is coagulated but still movable, we may get a fistula symptom but no caloric reaction. Each labyrinth tends to affect only its own side. If one labyrinth is destroyed, the nystagmus will be on the sound side.

The study of labyrinthine diseases discloses the fact that these conditions, especially the suppurative diseases of the labyrinth, follow chronic middle-ear suppuration. In general inflammation of the labyrinth may be circumscribed or diffuse, the diffuse being divided into two great classes, serous and suppurative, while the suppurative variety may be either acute (manifest) or chronic (latent). In the diagnosis of circumscribed labyrinthitis there probably exists a history first of cochlear disturbance, such as deafness, and a history relating to the vestibular apparatus such as vomiting or dizziness. The present condition should next be inquired into. There may be symptoms or no symptoms, hearing may be present or absent, and to the caloric test there may be reaction or none, but in these cases of circumscribed inflammation the fistula symptom will be present.

In a diffuse serous labyrinthitis there is history of a chronic middle-ear suppuration, labyrinth symptoms, such as nystagmus and nausea, the hearing may be partially or totally destroyed, the caloric reaction may be positive or negative, there will be no fistula symptom, and the nystagmus is toward the sound side.

In a diffuse suppurative manifest labyrinthitis there is history of a chronic suppurative middle ear disease, nystagmus to the sound side, no hearing, no caloric reaction, and no fistula symptom. In the latent form there is a previous history of a chronic suppurative otitis media, probably history of symptoms pertaining to the labyrinth, such as nystagmus, but none will be present at the time of the examination; for the labyrinth will have been totally destroyed, and the nystagmus persists only 10 to 14 days after destruction of the labyrinth.

Sometimes under narcosis a nystagmus develops. This is rarely rotary in type, while that following injuries is usually rotary. Cerebellar tumors frequently produce the same symptoms as labyrinth disease, while abscess of the temporal lobe is rarely associated with vestibular disturbance. Fractures of the base of the skull often involve the semicircular canals; certain poisons at times show a selective action on the labyrinth, while other drugs, such as quinine and the salicylates, act only on the cochlea and cause noises or deafness.

Nearly every examination, with the exception of the galvanic reactions, can be carried out with inexpensive and simple apparatus. A turning chair can be contrived and the usual douche bag with an appropriate nozzle and a pan to catch the excess water constitute the necessary apparatus for the usual caloric tests.

It is to be regretted that proper tuning forks are not supplied with the eye and ear cases and are not kept on the supply table. A "C_1" and "C_4" cover amplitude of vibrations sufficiently for ordinary tests, and with the addition of a small "a_1" the outfit would be complete for practical work. With the last-mentioned fork the normal hearing is 90 seconds. If it is not heard at all the patient is deaf—if he is truthful.

The operation of choice in chronic suppuration of the middle-ear spaces varies with the presence or absence of cranial or labyrinth involvement. A simple mastoid operation is of use only in an acute mastoid involvement, and if free incision and drainage through the drum has been established the operation is seldom necessary. An acute exacerbation and tenderness over the mastoid during a chronic middle-ear suppuration indicates a radical operation. In a circumscribed labyrinthitis a radical mastoid operation, or, indeed, any operation, is apt to extend the inflammation to a complete diffuse or suppurative one, but is performed to clear out the focus and give drainage.

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In diffuse inflammations if any hearing or vestibular reaction remains, it is best to start a radical mastoid operation, and if the condition warrants this can be converted into a complete destruction of the labyrinth, after the method of Neuman, working from posteriorly. Exploration of the cerebellum and middle cranial fossa can easily be carried out in this operation.

Sinus thrombosis may be present in these cases. It is indicated by a localized œdema over the posterior part of the mastoid, not associated with a general mastoid œdema. A very interesting symptom is that of Gerlach, but it is not generally applicable. If there is a thrombosis of the bulb of the jugular vein, no blood comes from the sinus; hence the external jugular will be small.

With meningitis as a complication of any ear suppuration, that is a general meningitis—not a localized abscess—prognosis without operation is absolutely fatal, while the complete and minute statistics of 500 cases, with operation performed by Ruttin, show but two recoveries. Operators in private practice report a larger percentage of recoveries. However, owing to the tendency not to report fatal cases in private work, their statistics are not as accurate as could be wished.

BIER'S METHOD OF TREATMENT IN ACUTE GONORRHŒAL ARTHRITIS.

(As applied at the Charité Hospital, Berlin.)

By Passed Asst. Surg. H. F. STRINE, United States Navy.

When properly applied and controlled, Bier's treatment of joints acutely involved by gonorrhœal infection produces definite beneficial results. Relief of symptoms is striking, disease cut short, and permanent damage to the joint prevented.

The description of the following case will illustrate the method:

A patient suffering from acute gonorrhœal arthritis of right wrist joint was admitted; pain, tenderness, and swelling were intense. A broad elastic bandage was applied above the elbow, just short of cutting off the radial pulse. The bandage was kept in place for 12 hours, then removed, the arm elevated for 1 hour to relieve œdema. The bandage was replaced for 12 hours, to be again removed for 1 hour, this to be continued until the joint returns to its normal condition. At the end of the first 12 hours the pain had subsided and tenderness was less marked. At the end of 24 hours the joint could be moved without pain. One week from time of admission the joint appeared normal.

This result is expected in all cases if treatment is begun early in the course of the disease. Subacute and chronic cases do not respond as well; these cases are treated by alternating Bier's method with hot-air exposures.

The hyperæmia produced must be intense. Dr. Auxhausen stated that he knew of no case where damage had resulted from too tight ap-

plication of the bandage. Of course the pulse must not be obliterated. Usually the fault lies in not sufficiently obstructing the return circulation. If the œdema at any time becomes too pronounced, or signs of blocked circulation appear, remove the bandage, elevate the limb for one hour, then replace the bandage. Instruct the patient to test frequently the temperature of his hand or foot, as the case may be, and keep him under observation.

PROBLEMS OF SANITATION IN LANDING AND EXPEDITIONARY SERVICE IN TROPICAL AND SUBTROPICAL REGIONS, BY MARINE OBERSTABSARZT RIEGEL.

Translation by Pharmacist PAUL J. WALDNER, United States Navy.

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EQUIPMENT OF THE INDIVIDUAL.

Regarding the equipment of the individual, so far as it may affect the health of the man, the following points are to be considered:

Burdening the man.—The burden, in accordance with the materially lessened endurance in tropical countries, should be reduced to the limit of need. Herhold demands that the clothes and equipment for the march should together not exceed 15 kilograms, against the 31 kilograms carried by our soldiers in Germany. Care should be observed to arrange for a well-balanced distribution of the weight. In no circumstances should the pack interfere with breathing and the circulation. Aside from arms, ammunition, and other military necessities, each man must carry at least a portion of the day's requirement of water to compensate for the loss of water which heat regulation necessarily involves. All other equipment and necessities must be transported by such means as the customs or facilities of the particular country may furnish, without which no undertaking of any magnitude can be pursued by white troops in the Tropics. When close to the enemy the equipment should be supplemented by some wound dressings, preferably by two first-aid packets, such as prescribed by us.

Equipment for night encampment.—For healthy night encampment in the open the following things are necessary: A waterproof blanket to lie upon, which should be made of strong, actually waterproof material. (In this connection the suggestion of Wiemann, that the present pattern be so enlarged as to permit complete covering of the man against rain and dew, is worthy of consideration.)

A tent fly is also necessary, which, aside from affording protection against rain, may be used as a shelter from the sun during the noonday rest. For covering, a medium weight woolen blanket, if possible

waterproof, which could be replaced advantageously by two thin blankets, only one of which need be waterproof, and, finally, a mosquito netting of proper size. If to these be added a field bed of the wooden fiber sort much used by natives, a camp bed may be prepared answering all requirements of health. The field bed is superior to a mesh hammock, as the latter is with difficulty made mosquito proof; moreover, it is not often likely that trees can be found from which hammocks may be swung without spreading the troops over a very large area, which in itself is objectionable from a military point of view.

Large tents are very desirable, but the difficulty of conveyance makes them impracticable except for extensive expeditions. According to Zur Verth, a five-load tent, accommodating six men, was found very serviceable in southwest Africa.

Equipment for care of the skin.—Inasmuch as the skin does most of the work of heat regulation, its care is a matter of great importance in the maintenance of health. Daily thorough washing of the body is imperative. For this purpose canvas water bags, 1 for every 12 men, serve very well. Soap for washing and bathing should be liberally supplied.

Cooking utensils.—For reasons to be touched upon later a meat-cutting machine and a large boiling kettle should be supplied for every 12 men.

THE MARCH.

Sick call before and after the march.—Of great consequence in the maintenance of the health of troops is a constant watchfulness over the marches. Before beginning the march, sick call should be held, at which the capability of the individuals to perform the march should be determined. The findings of the sick call should be communicated to the commanding officer of the expedition in time to insure compliance with the recommendations made. Musters before a march are to be shortened as much as possible. As soon as practicable sick call should again be held when the march is completed, in order to bring the sick, especially for foot disabilities, promptly under treatment. Promptness in this matter brings very good results. Attention is here invited to the experience of Grothusen, who readily removed the recently buried sand fleas (*Pulex penetrans*) by touching them with liquefied carbolic acid. During the march close medical observation should be exercised in order to guard against more serious consequences in the overheated and worn-out.

Duration of march.—Five kilometers per hour probably represents the maximum which can be accomplished ordinarily and often, particularly in warm, damp weather it may fall much short of this. As a rule, duration of march should not exceed five or six hours (Kohl-

stock), so that 25 to 30 kilometers can be considered a daily marching distance. Such distances were covered by our marine detachments without difficulty in East Africa (Zur Verth). In emergencies and for short periods more could no doubt be accomplished without detriment to health, particularly if some compensation can be made by reduction in the weight to be carried.

Time of march.—The early morning and late afternoon hours are mainly considered for marching. In the midday hours from 10 to 4 no marching should be done unless in exceptional circumstances and in very favorable weather. Conditions must determine how the marching hours are to be divided through the day. For many reasons it would seem best not to split the march into two parts by the midday rest, but rather, if possible, to execute the entire merch in one period during the early hours.

Night march.—In general, night marches are not to be advised. Duncan condemns them entirely. They are hazardous to health, not only on account of the increased danger of intermittent fever, but also because most men are by habit unaccustomed to sleep during the day, and therefore the men are often severely affected by loss of sleep. In exceptional instances, when the route lies over shadeless, sun-exposed regions, where scarcity of water may be feared, night is preferable to day marching.

Order of march.—The order of march for sanitary reasons should be as extended as possible. Its form is generally controlled by the comparatively narrow pathways of the country. Undue length of formation is often thus entailed. Wissmann (according to Schwabe) states that a marching troop in Africa covers, for 100 men, 250 meters; for 600 men, 2,500 meters; and for 1,000 men, 5,000 meters. Carriers cover much greater lengths. For 1,000 carriers with their burdens Montanaro figures on 15 kilometers; in other words, as much as the troops can march in half a day. These conditions justify the belief that the military leaders and the sanitary personnel who must be here and there at any point in the column should not be restricted to the foot march, but be provided with horses or such other beasts or conveyance as the country may afford if they are to render their best service in an expedition of any size.

Pauses on the march.—The time and length of short rests on the march must be determined by the condition of the troops. The breathing, pulse, and even body temperature should be factors for consideration.

Drinking on the march.—Advantage should be taken of the pauses for refreshment with drink. The men are to be reminded, particularly at the beginning of the march when the bodily demand for water is comparatively small, not to drink freely but to sip slowly as thirst is allayed most effectively by retaining the water in the

mouth for some time. Later, when perspiration has depleted the body of water, free drinking may be permitted. As the supply of one or two flasks—to carry more would be unduly loading the man—is soon exhausted, it is imperative that water carriers should follow to replenish the flasks. For this purpose Wiemann recommends the water bags employed by the troops in southwest Africa, as they possess the advantage of cooling the water by surface evaporation. Likewise, the water in the canteens may be cooled by wetting the cloth covering at every opportunity in a stream or by other means, thus providing for surface vaporization.

Food on the march.—The food of troops on marching duty must be good and the supply liberal, commensurate with the hard work performed, albeit three meals are sufficient. One, the early breakfast, must in all circumstances be given before beginning the march; the second before beginning the midday rest, although for reasons of health it is unwise to permit cooking at midday. The principal meal should therefore be had in the evening. At this time in the Tropics the appetite is usually keenest. For the preparation and the eating of meals ample time should be allowed. Poorly prepared and hastily eaten food favor the development of stomach and intestinal troubles.

Wearing the helmet on the march.—The helmet must be worn when the sun is high—between 10 and 3 o'clock daily—in the Tropics. In the southern hemisphere, for reasons already indicated, even greater care in this respect is necessary than in the northern. That the number of sunstrokes is greater in the southern half than in the northern has not been shown, but this is very probable. In any event the closer proximity of the sun is distinctly perceptible to the senses (Assmann). Wiemann also emphasizes the strikingly increased effect of the sun's rays on the skin during the hot months in southwest Africa. Undoubtedly this peculiarity in part is ascribable to the higher altitude of this region. Thin and scattered clouds in no way offset the necessity for wearing the helmet during the midday hours; on the contrary, they only indicate the need for greater caution in this respect, inasmuch as experience has shown that they favor sunstroke. This is readily understood in connection with the fact that a thin veil of clouds quadruples the chemical effect of sunlight (Hann). Only when the heavens are overcast with heavy rain clouds should the helmet be replaced by the cap.

THE CAMP.

Camp site.—The careful selection of the camp site is of prime importance to the health of troops in the Tropics. If the military situation will permit, particularly in comparatively small undertakings, it would be well for a medical officer to be assigned to the duty

of selecting and preparing the camp site. In large expeditions the cooperation of a medical officer in the selection of a site is indispensable. As the magnitude of these undertakings increases, just so will the necessity for intelligent medical cooperation, working hand in hand with the military preparations, be manifest. The inspection and preparation of the country should be several days' marches in advance of the main body, so that the camp may be in a fit sanitary condition for the reception of the troops.

Unsuitability of human habitations.—Native villages and huts are absolutely unsuited for the quartering of troops. For here, as elsewhere, the fact obtains that in the propagation of the epidemics and diseases of man, man himself is the chief factor. This applies particularly to recurrent fever, dengue and intermittent fever, but plague, dysentery, cholera, smallpox, kala-azar, and other tropical diseases may readily be contracted in the huts of natives. Deserted villages and former camps should also be avoided for the same reasons, to which may be added the observation that poisonous reptiles and scorpions show a peculiar tendency to inhabit old walls and ruins.

Nature of the camp site.—For the above reasons the choice for a site should fall on a virgin tract at least 1,000 meters distant from the nearest human habitation. Proximity to running water is naturally desirable, but ponds and pools as breeding places for insects are to be avoided. The soil should be permeable and rather inclined than entirely level. A windward hillside is a good location. It must be borne in mind, however, that in the coast regions the windward side by day is usually the lee side at night. Open country is to be preferred over wooded land on account of the lesser danger from mosquitoes and the tsetse fly.

Protection of water source.—The first concern must be the protection of the water source, which on a flowing stream should be above the camp. This place should be cleaned and inclosed by a strong fence of thorns and barbed wire to exclude any unauthorized persons as well as animals. Finally the place should be guarded by a carefully instructed sentry.

Latrines and waste pits.—Next, at the opposite end of the camp, the location of latrines and waste pits should be staked off. These should be located about 100 meters from the camp and appropriate to the direction of the prevailing wind and the slope of the land. If too far removed from the camp the danger always exists that tired troops may try to evade their use. In digging the trenches, or pits, care should be observed that they be at least 50 centimeters deep and as narrow as their depth and the width of the spade will permit, so that the men may comfortably squat *across* them in the direction of their length. The upturned soil is to be loosely deposited on both

sides in order that the earth may be conveniently thrown over the excreta with the foot. This procedure must be followed to guard against the part which the fly plays in the transmission of communicable intestinal diseases (Trembur). That human excrement should be covered with earth is a rule of camp sanitation of the earliest origin. (See Book of Moses, chap. 23, v. 10, 13, and 14.) The trenches should be of such depth as to hold easily the excreta voided during one day and still permit liberal covering.

Slaughter and wash places.—In large camps places for the slaughter of cattle and for the washing of clothes must be designated with intelligent regard for the menaces which such places may become to human health.

Segregated camp for the colored.—The camp for colored helpers and carriers is to be located according to the same fundamental rules, but entirely and widely separated from the camp of the white troops; thus isolation, which may become necessary in the event of the outbreak of an epidemic, will be materially easier by reason of the wide separation. Inasmuch as the colored are firmly opposed to all rules of sanitation the carrying out of the proper measures can only be secured by unremitting vigilance. The establishment of a sort of sanitary police, under medical leadership, composed of a good staff of reliable white petty officers and men, would serve a very useful purpose.

Necessity for sparing the European in camp.—The rule that the European must be spared as much as possible on the march applies as well to camp life. Heavy work, such as the felling of trees and providing fire wood, etc., should be left to the natives. The European should confine himself to making his water supply palatable and potable, caring for his arms and accoutrements, cooking, and caring for bedding.

Bodily cleanliness.—After heavy work and best before eating, the body should be given a thorough washing. If large running or still waters are at hand a full bath should be taken. At least a sponge bath from head to foot is required.

Night rest.—Complete rest should be given the men as early as possible. In the absence of tents a shelter can readily be extemporized in wooded districts by the natives with branches and leaves. A good field bed can be constructed by supporting two poles on four short legs driven into the ground which may then be covered by pliant reeds or twigs. The mosquito netting can be easily secured to such a contrivance.

PROVIDING DRINKING WATER.

As compared with the Temperate Zone the demand for water, as a result of the greatly increased water loss, is simply tremendous in the Tropics. This condition makes it extremely important to supply

an adequate quantity of healthy water. The daily requirement of the individual will be 5 to 10 liters (see also Plehn), and on severe marches will even exceed these figures.

Sensitiveness of the body to loss of water.—Of all forms of nourishment water is the most indispensable in the Tropics. The animal body can bear very well considerable and rapid losses, such as fats and albuminoids, but is extremely sensitive to water loss. In animal experimentation a 10 per cent loss gave plain evidence of indisposition, such as unrest, weakness and trembling (Nothwang according to Rubner). As the average water content of the body is about 63 per cent (Rubner), a man having a 60 kilogram body weight would, even in a moderate climate and in a state of rest, show distinct symptoms of harmful effects with a water loss of only 3.8 kilograms, and these effects would be the result of the simple impoverishment of water in the body tissues regardless of the question of heat regulation. Inasmuch as heat regulation alone, in heavy work such as a military march entails, would in itself require an expenditure of water not much less than the above amount, it is apparent how momentous in two directions one day's deprivation of water would be in its effect on the health and endurance of troops in the Tropics. The men would be in danger of succumbing on the first day to tissue thirst and excessive accumulation of heat due to disturbance of heat regulation.

Drinking water from the ship.—Only in landings close to the coast and in fixed communication with the ship will it be practicable to supply the force with distilled water in barrels in sufficient quantity. In undertakings of greater scope this will not be feasible. In such cases recourse must be had to the waters of the region, and in most cases this will be surface water.

Surface water: This water is always to be regarded with suspicion. Riegel says: "The wells and springs of the natives, as well as open waters, such as creeks, rivers, and lakes, which may be found near settlements, must in general be looked upon as polluted. At least we have no means other than a well-equipped laboratory to prove otherwise. The chemical examination by the pastille method may be quickly and simply done and gives in some respects important, and in certain circumstances, decisive information, but to answer the question, 'Harmful to health or not?' it needs the support of the findings of a bacteriological examination. Such examinations, however, take time and equipment which the conditions surrounding a landing force make impracticable. Therefore the water which is given to the men must be so treated that it will be free of the disease germs which it contains or may harbor. The responsibility for permitting the consumption of water as it is found, carelessly depending on good luck,

will be taken only by such as are entirely ignorant of the lessons and experiences of military and colonial history."

Preparation of water for drinking.—The preparation of healthful water on expeditions in the Tropics presents a difficult problem. Many methods are available, but all are in certain circumstances open to greater or lesser disadvantages; some, in fact, are entirely impracticable.

Chemical means.—The chemical agents, such as potassium permanganate, chlorine, bromine, iodine, hydrogen peroxide, etc., which have been advocated to render water free of disease germs, have recently been generally discredited for the reason that, aside from other objections, there is no positive assurance of entire destruction by them of disease germs. A method advanced by Riegel may in a sense be appropriately mentioned here. Water to which citric acid has been added in the proportion of 6 to 1,000 is subjected to sunlight for about one and one-half hours in open vessels, and experiments with this method have given satisfactory results. The procedure is, however, obviously entirely unsuitable for large undertakings. In emergency, particularly when for one or another reason the water can not be boiled, it might serve well in cases where small quantities are required.

Ozone.—Apparatus in which water is made germ free by the agency of ozone, while effective under fixed and uniform conditions, can not be considered for use with troops in the Tropics. They are too sensitive and cumbersome (Rouget). Aside from this they are open to the objection that the amount of ozone and the rapidity of its passage through the water—if intelligent economy is to be observed—must be adjusted to each individual water according to its content of oxidizable organic matter. To this end preliminary experiments, which can only be properly checked by bacteriological examinations, are necessary (Bischoff). Instances might be possible of water very rich in oxidizable matter, such as tropical surface waters in which lower animals and plants are very abundant, which might escape entire eradication of germs by the ozonizing process. This supposition is given support by certain unpublished experiments conducted in Rubner's laboratory with milk and ozone, in which the abundance of oxidizable matter in milk prevented the complete destruction of otherwise feebly resistant organisms.

Filters.—Regarding filters—only the Pasteur-Chamberland and the Berkefeld filters are considered—final judgment has not yet been passed. Riegel's experiments with the Berkefeld filter, which, by the way, is light and easily handled, gave very good results, although not as yet substantiated in practice. Reports on the use of filters in the field make particular complaint against them on the ground that they need specially instructed people to handle them; that with very turbid water they become rapidly occluded, and

therefore lose enormously in output; that they are difficult to clean and easily broken (Ruckert). Favorable reports are received only from the more settled conditions of field hospitals (Wiemann). The utility of filters, especially the Berkefeld, has recently been severely shattered by Razzeto, who showed that single-celled animals, among them some of considerable size, such as amœbæ, pass completely through many filters. Thus their protection against amœbic dysentery, which as regards the number of instances and the severity of its sequelæ, is more to be dreaded than bacillary dysentery, is nullified.

Boiling the water.—So the only sure means is boiling the water. This can be accomplished over the open fire in kettles and other cooking utensils. Boiling has the disadvantage of rendering the water less palatable and that considerable time is required to cool the water sufficiently. To overcome this objection, the device of boiling the water in closed pipes has been suggested. The water cools in the return flow. The practicability of this method, however, is limited for use in the Tropics. Portable sterilizers, for example, that of Tietschel and Henneberg, which weighs about 45 kilograms and can be divided in two carrier loads, and the apparatus of Forbes, used by the Americans in the Philippines, separable into three loads of 20 to 25 kilograms each, can follow the troops on the march everywhere. They, however, require careful attention, and with very dirty water are easily rendered useless. Their construction is not sufficiently simple for war purposes in the Tropics.

Alum clarification.—Frequently clarification of the water before boiling will be found necessary. The most serviceable process is alum clarification and is accomplished by the addition of a small amount of alum with constant stirring for about 15 minutes, upon which the floculent precipitate formed is permitted to subside, carrying with it the suspended matter. The operation requires competent supervision. Left to themselves the men are very apt to follow the old rule "Much helps much." But exactly the opposite should be practiced, as careful observation of the working of the process will show. Like all solutions of salts, alum solution is most easily decomposed in weak solution. Only in very dilute solution will the decomposition by which aluminum hydrate is thrown out take place with the rapidity necessary for clarification. Usually a dilution of 1–50000 (1 gram to 50 liters) is sufficient. With very turbid water it is best to treat the water several times successively rather than try to clear by one operation with relatively large amounts of alum. By the use of alum one-half of the double salt—the sulphate of potassium—remains in solution. Although, under competent management, only very small amounts of this substance remain in solution, nevertheless it is possible that, under long-con-

tinued consumption of water cleared with alum, damage to the heart may be brought about by the action of potassium. The effective component of alum in clarification—the aluminum sulphate—has recently been artificially prepared, and according to Gotze it is as efficient as alum itself. This salt might be especially adapted to use in expeditionary work in the Tropics by reason of the reduction in bulk of material required and on account of the elimination of the danger of potassium effects.

Means for improving palatability.—In the process of boiling water loses its carbonic acid, to which uncooked water owes its refreshing taste. In large expeditions and in field hospitals this loss may be easily overcome by appropriate carbon dioxide apparatus. It would be an advantage if the manufacturers of these apparatus would so modify them that there would be less waste of the gas. As a rule the uncooled water in the Tropics is unable to hold much gas in solution, and in consequence there is a purposeless evolution and waste of gas whenever a bottle or siphon is opened. Generally speaking, however, carbon dioxide can not be considered as a means for improving the palatability of water, and recourse must be had to simpler means, such as fruit juices and vegetable acids, especially citric, combined with sugar. The fruit juices, provided they be pure, are entirely harmless, whereas the vegetable acids when taken overfreely, which is very likely under stress of constant thirst, may possibly produce ill effects. At any rate their use should be alternated with other means.

Coffee, tea, and other drinks.—The practice of supplying the body demand for fluid with coffee and tea enjoys wide popularity. These substances, which are not without appreciable effect on the heart, should of course be used with judicious moderation. Dirksen questions coffee as a thirst appeaser in hot weather and condemns it entirely in connection with exhaustive work. A welcome change will be found occasionally in the milk of the cocoanut, the juice of unripe mangoes (Zur Verth), and that of the tamarind.

ALCOHOL.

There can be no dispute on the question of the unsuitability of alcoholic beverages for quenching thirst in landings and expeditions in the Tropics in view of the large amount of fluid required and the side effects which even the mildest alcoholic drinks consumed in such quantities would produce. The only question is as to what extent the enjoyment of alcohol may be permitted in such undertakings without fear of disturbing the effectiveness and health of troops. On this question also opinion is now almost unanimous. Most physicians—and their opinion is entitled to first consideration when dealing with the value or worthlessness of a protoplasmic poison of such pronounced effects on the body and its functions as are all the

narcotics of the fatty series—reject absolutely the regular use of alcohol in tropical expeditions, even though they are not otherwise opposed to alcohol (Braune, Kohlstock, Plehn). Far greater, however, is the number of physicians who advocate total abstinence from alcohol in the Tropics (Hueppe, Treille, Wulffert, Fiebig, Kulz, Ziemann, Kuhn, and numerous others).

That athletic sports which tax the heart are not compatible with habitual use of alcohol is generally recognized even by the laity who have had experience in such matters. In general, military marches, especially in the Tropics, as regards their demands on the heart and vessels, must at the very least be given the same value as the exertions of the average athletic sport. How little this fact is appreciated by the general public is well illustrated by the statement of Korting that 35 per cent of the gifts sent to the soldiers in southwest Africa during the uprising of 1904–1906 were alcoholic beverages. How much wasted heart energy and how many years of imprisonment those troops may lay at the door of these "gifts!" According to the observations of Martin in the Celebes, an intimate relationship may easily be recognized between heart affections and the habitual use of alcohol in military exertions. In addition, alcohol effects a dilatation (*erschlaffung*) of the vessels of the skin, a part of the vascular system which is already overworked by the process of heat regulation, and therefore particularly in need of rest. The fat-conserving property of alcohol, which is always worthy of note, and which in a sense raises it to the class of foods, is not to be considered for the reason that, unlike the fats and carbodydrates, it is not stored up, but on the contrary is rapidly consumed even when no immediate necessity exists. Thus, when taken at an improper time it may harmfully affect heat regulation. Therefore its use as a daily drink, as a refreshment rewarding special exertion, as a means of diversion, or as a dispeller of care should be emphatically opposed for reasons of health in any expedition in the Tropics. Nevertheless, it may be that alcohol can not be entirely dispensed with. There is no doubt that it sustains heart action and muscular strength, though only temporarily, and consequently, given in small portions, materially helps the hungry and exhausted. In such rare instances its use might be justifiable; for example, when it is necessary to take an enemy's position by storm in a final assault with hungry and worn-out troops who must be called upon to give their final stimulated effort.

NOURISHMENT OF TROOPS.

The nourishment of troops has in many ways important bearing on the health of troops, and by reason of the many dangers which a faulty diet threatens the matter needs constant and careful medical supervision.

Undernourishment.—Above all, nourishment must meet the requirements of the metabolic changes of energy and matter. It will hardly ever be possible to prevent a material loss in average weight in newly dispatched landing divisions in field life, but so long as this loss is only water and superfluous fat it makes the men just so much more serviceable.

Constant loss associated with destruction and loss of bodily albumin—undernourishment—must be prevented by all means. Experience has demonstrated that undernourishment combined with exhaustion materially reduces bodily resistance to diseases of every nature. "The epidemics of war follow on the heels of defective care of troops." (Rubner. See also Ficker.) Moreover, deficient nourishment is detrimental to mental as well as physical capacity. The undernourished soldier or sailor is tired, indolent, and peevish, lacking in ambition and energy—qualities which are of momentous importance to a force in an enemy's country. The nourishment should therefore be good and plentiful.

Requisite nourishment.—As the required number of heat units is a constantly changing figure depending on the work done and upon a whole series of side influences, and for the further reason that the various foodstuffs differ in value according to their source and method of preparation, it is not practicable to calculate the requisite amount of nourishment necessary for military life in the Tropics. The question as to whether the food is sufficient can only be solved by observation and experience. As stated before, metabolism under the same amount of work is the same in the Tropics as in our latitude, from which we may infer that the amount of food in general should be the same. This statement must be qualified, however, by the consideration that, as a rule, foods in the Tropics are of poorer quality and less frugally used than in other sections. These factors must be taken into account in determining the issue of food, especially in the matter of fresh meats, which are never as good in the Tropics as in our latitudes.

Preserved provisions.—For various reasons the food supply in military operations in the Tropics must be composed of preserved foods, and the larger the undertaking the more exclusively must dependence be placed on this class of foods. The same requirements apply as would be the case at home. Tropical climate will subject their keeping qualities to the severest test. Variety should be given every attention.

In a country rich in meat the troops can preserve their own meat as "biltong," which consists of thin strips of meat dried in the sun. Murray gives this substance the highest praise and prefers it to any other form of preserved meat, stating that, when protected against moisture, it will keep for years. Its special advantage over canned

meats for expeditionary service is its lightness. As even the best preserved foods develop a sense of aversion in time, and in the end lead to disturbances of health, no opportunity should be lost to provide fresh foods whenever possible.

Fresh, particularly vegetable foods.—The vegetable foods of the natives will often prove a welcome change. The much missed white potato is replaced in a measure by the sweet potato (*Ipomoea batatus*) which may be obtained almost anywhere in the Tropics; by taro (*Colocasia antiquorum*); by yams and by the widespread manioc, although one must get accustomed to the hard, soapy composition of the latter. Zur Verth states that when baked they closely approach the potato in palatability. In the use of manioc it must be borne in mind that when fresh the outer covering contains hydrocyanic acid, which may give rise to poisoning, particularly a chronic type. The poison may be removed by thorough boiling or subjecting to the action of running water for several hours. For vegetables and salads any number of tropical plants may be used, among which are such as appeal thoroughly to the tastes of the European. Mention is made here only of several varieties of bean and bean-like fruits. The vigna bean (*Vigna sinensis*), found in mountainous Africa, the widespread Zanzibar bean (*Phaseolus mungo*), much like our garden bean, and the important Helm bean (*Dolichos lalab*). A specially fine dish may be prepared from the buds of young cocoa plams and young bamboo sprouts, as well as the fruit of *Solanum melongena*, and other varieties of Solanum, for example, *Solanum bogerie*. The most practical methods of preparing these substances may be found in tropical cook books, such as that issued by the *Kolonial-Wirtschaflichen Komitee*, or the cook book for the Tropics by Brandeis, and the "*Kleine Kochbuch*" by Hohenwald. If the officers, by good example, lead the way the men will soon overcome any previoulsy formed prejudice against these foods. The well-known tropical fruits and those which the natives eat without harm may be unqualifiedly indorsed. The men should be emphatically cautioned against eating unfamiliar forest fruits.

Meat inspection.—One of the most important duties of the sanitary service is meat inspection along the lines customary in Europe. One of the essentials is to see the animal alive.. Men who are, or have been, suffering from intestinal catarrhs are not to be employed in the slaughter or preparation of the meat, or in fact, in connection with any foods on account of the possibility of transmitting typhoid fever, and particularly paratyphoid.

The actual slaughtering should be supervised. The tendency to kill animals by shooting with the rifle is to be combated, as, particularly in the Tropics, poorly bled meat loses distinctly in quality.

Milk.—Fresh milk will only rarely be available. It would always be regarded with suspicion, and should never be used unless boiled. For sick diet a suitable milk powder may be employed.

Spices.—Spices of various kinds are necessary to stimulate the appetite. Pauli recommends the "Maggis" soup spices and "Maggis Bouillon Tablets."

The preparation of food requires medical supervision.—The cooking by the men should be watched by the medical officer in order to prevent the development of methods and habits inimical to health and the primary purposes of food. Ordinary cooking utensils are not well adapted for the purpose; kettles big enough to cook for a considerable number are more practical. Meat requires special attention, as it is almost always tough and must be used soon after the animal is killed. If possible it should be hung up for at least 12 hours covered with gauze to protect against flies. Very often, however, in order to eat it at all it must be run through a meat chopper, which should therefore be considered a necessary part of the equipment of a tropical expedition. If the roadways permit, cooking wagons do excellent service.

Traffic in foodstuffs with natives.—It is hardly necessary to mention that traffic in foods with natives requires the most careful supervision. If even the slightest suspicion exists that disease, especially of the intestinal type, may be transmitted, it should be entirely forbidden. To arrive at a correct estimate of the nature of the intestinal diseases which may exist epidemically among natives, it might be well to apply the Ficker method of diagnosis to the blood of a number of the natives.

Disease prevention in particular.—Prevention of particular diseases, such as relapsing fever, the infectious intestinal diseases, and also intermittent fever and dengue, so far as protection against mosquitoes and flies is concerned, has been previously discussed.

Quinine prophylaxis.—As protection against mosquitoes under the peculiar conditions of expeditionary work can never be quite thorough, quinine prophylaxis is absolutely essential to the maintenance of health of troops in regions where intermittent fever is endemic. White and colored should come under its treatment; the latter because they may be responsible for the infection of the white and for the further reason that, although they may come from a fever-stricken region and therefore presumably are immune, under unfavorable conditions in a new locality they develop severe attacks of intermittent fever (Plehn), and total disablement of the carriers may threaten dissolution of an expedition. Quinine prophylaxis is only effective when consistently and regularly carried out. To this end, even in simple undertakings, careful tabulation must be maintained. Prefer-

ably the quinine should be given the men by the physician himself in wafer or readily soluble tablet form, invariably followed by a swallow of acidified water. Before bedtime is the best hour to give the quinine.

Men who must stand watch the same night are to be excepted, as head symptoms and wakefulness are not unusual. They should therefore receive their quinine the day before. The most useful plan, and that recommended by Ruge, is to give 1 gram on two successive days. Complete protection is of course not conferred by this method any more than by any one of the other many ideas advanced. However, the [German] Navy's experience (Muhlens) has been so satisfactory that no good reason exists for making any change. The procedure of Nocht—namely, the division of the gram dose into five portions, to be taken at intervals during the day—is too time consuming in a large force and is therefore not practicable, even though its advantage of being easily borne by the very sensitive must be sacrificed. Whether quinine is to be given every sixth and seventh, or every seventh and eighth, or even every eighth and ninth, day depends on the danger of infection. Even when danger is over—for instance, when the march has passed through the infected coast regions to the healthy highlands in the interior—quinine must be given for some weeks, at least six, for the reason that it must always be assumed that some have been infected and disease symptoms have been suppressed by the quinine administration. In such cases the quinine must be continued to kill the parasites in the circulation.

ARRANGEMENT OF THE SANITARY SERVICE.

If the sanitary service is to discharge efficiently all of its difficult and varied duties, it must be so arranged as to be prepared not only for war and battle service, but must be so constituted that the changing conditions will permit of its subdivision into self-supporting parts or units without disturbance. This applies to field hospitals as well. In the equipment and packing, forethought should be given to this feature of subdivision.

Small, movable field hospitals of about 30 beds were found much more useful in southwest Africa than the large 200-bed hospitals (Korting). The personnel must be materially larger than in a European war in consideration of the necessity for breaking up the force into small parties which should be accompanied by sanitary personnel. Needless to say that the colored carriers and menials which are assigned to the sanitary service should be organized along military lines and drilled in their work.

SANITARY EQUIPMENT.

Few general rules can be laid down as to equipment. This must vary very largely with the nature and magnitude of the undertaking, its locality, the probable duration, the estimated number of sick and wounded which may reasonably be expected, etc. As repairs en route are often impossible, all articles should be of the best material and workmanship. Articles should be capable of separation into parts convenient for carrying as a pack.

Especial equipment for medical officer acting singly.—That each medical officer acting singly should be provided with a traveling microscope is generally conceded. In view of the important bearing which relative humidity has on heat regulation of the body and therefore on its functional capacity, a good hygrometer would be of considerable value. Lambrecht's polymeter is well adapted to this purpose. This instrument, in which a hair hygrometer is associated with a thermometer, not only gives the relative humidity and temperature, but also everything necessary to a correct viewpoint of the degree of humidity, such as the dew point, vapor density, and moisture abstracting power of the air. Adjustment and regulation of the instrument can be done in the field without much difficulty.

Equipment for transportation of sick and wounded.—The [German] Navy stretcher can be used only for short distances. For long distances it has the objection that it affords no protection against the sun, and particularly that it is arranged for only two carriers. For this reason it can follow troops only for a short distance even on good roads. It can, however, be modified to overcome these disadvantages by suspending it from a long pole in the fashion of the English dhooleys, thereby providing for eight to twelve carriers. A tent fly thrown over the pole protects against the sun. If the roads and other conditions permit, carts are to be preferred for the transfer of wounded and equipage. The most useful cart is that built on medium height wheels and so arranged as to be capable of conversion into a four-wheeled wagon by a combination of two carts (Schwabe). The wagons are to be arranged for two tiers accommodating two patients each. For the transport of equipment the mule seems best adapted. With a packsaddle of the English-Indian pioneer type he can follow troops through any kind of country.

Dressings and medicines.—The dressings are most serviceably packed in small water and dust proof packages. For expeditionary service, medicines in tablet form are most practicable, and such as are intended for hypodermic use should be in germ-free solution in hermetically sealed tubes. A "sanitary chest" provided with well-chosen materials proved well adapted to the purpose in southwest Africa.

THE MENTAL EXAMINATION OF CANDIDATES FOR ENLISTMENT IN THE NAVY AND MARINE CORPS.

By Passed Asst. Surg. HEBER BUTTS, United States Navy.

Despite the care exercised by naval medical officers in endeavoring to see that candidates for enlistment in the United States Navy and Marine Corps measure up to certain high standards of physical excellence, a great many imbeciles and potentially insane men are being and have been enlisted. From an examination of the case records of 528 insane men from the active lists of the Navy and Marine Corps who have been admitted one or more times to the Government Hospital for the Insane during the period January, 1899, to June 1, 1910, I find that the predisposition to insanity existed prior to enlistment in 274, or nearly 54 per cent, of these cases. The determination of this fact is based upon the official statements of naval medical officers made in reports of medical survey which have accompanied the patients to the hospital.

I have arrived at two conclusions:

1. A sound mind does not necessarily go with a sound body, as has been so long believed. This fallacy might with equal justification be applied to any other organ of the body, and we might say that a sound kidney, or a sound heart, necessarily goes with a sound body. If this were true we would not find albumin and casts in the urine of a splendid, well-built, apparently healthy young man as we frequently do. Each of these 528 insane men of the Navy and Marine Corps was at the time of his enlistment considered sound in body by the medical officer who enlisted him, but nearly 54 per cent of this number were found by 274 boards of medical survey to have unsound minds which existed prior to enlistment.

2. A mental examination in addition to the physical examination which is now given to each candidate for enlistment is absolutely necessary in order to exclude imbeciles and potentially insane men from the Navy and Marine Corps.

There is no convenient way to estimate the large number of "dummies" and imbeciles in the services whose mental infirmity never becomes so pronounced as to require their commitment to an institution for the insane, but who, nevertheless, are constant eyesores to the service, and in a certain sense are really more of a nuisance to those with whom they come in contact, and source of expense to the department, than those who actually become insane. The insane man who is committed to an institution for his care is not a factor in the active service after his commitment, and his inefficiency and misdoings are no longer a source of annoyance, expense, and danger. The enlisted "dummy" or high-grade imbecile continues in the service; his work is poorly done; he is not to be trusted, and

in this respect his carelessness is frequently a source of genuine danger to those with whom he comes in contact. He is the hospital steward or yeoman who can not correctly add up a column of twenty or more figures to save his life. He is the hospital apprentice who gives a patient a teaspoonful of Fowler's solution instead of paregoric, as ordered. He is the gunner who carelessly smokes cigarettes while handling high explosives in the turret or magazine of a battleship. He is the man who is constantly getting drunk, being called to the mast for misdemeanors aboard ship, or being court-martialed for absence without leave, for desertion, for sleeping on post while on duty, or for acts of sexual perversion. He is the man with the "invalid habit," a frequent visitor at the sick bay, who asks to be put on the binnacle or sick list for imaginary or real ills.

I have to suggest the following scheme for the mental examination of candidates for enlistment in the United States Navy and Marine Corps. It is a result of the careful study of these 528 cases of insanity, and in its preparation I have received the generous assistance and kind suggestions of the superintendent, Dr. William A. White, and other staff officers of the Government Hospital for the Insane, particularly the psychologist and scientific director, Dr. S. I. Franz.

It will be noticed that a consideration of the family and personal histories of the candidate forms the first and a conspicuous part of the examination. This in itself is a very good test of the candidate's memory for past events, and acquaints us with hereditary taints, previous attacks of insanity, and commitments to insane asylums, reform schools, and penitentiaries. In my series of 528 cases, 101 gave a definite history of nervous or mental disease (epilepsy, insanity, etc.) in their families or collateral relations; 34 gave a vague history of nervous or mental disease (chronic headaches, ungovernable temper, etc.); 47 gave a history of tuberculosis in their families; and 74 a history of alcoholism in one or both parents. It should be remembered that many of the patients who come to the hospital are in such a demented condition that it is impossible to acquire definite information regarding much of their previous life and of their ancestry, and because of this condition the figures which are here given are undoubtedly far below the actual facts. Of course many candidates will lie about such matters, or attempt to conceal the information, and it is a part of the medical officer's duty to detect such prevaricators. Liars are not wanted in the service, and it is well to remind the candidate of this fact in case he is thought to be lying. If he persists, he should be considered as not having a proper sense of morality, and consequently mentally inferior. He may properly be rejected.

It is not believed that the use of this scheme will exclude all potentially insane men, who in future will have to be admitted to institutions for the insane, but it is claimed that intelligent use of this

scheme will enable any naval medical officer to reject, at recruiting stations, a large percentage of potentially insane men who are now being enlisted, and a still larger percentage of "dummies" or imbeciles.

In the way of explanation of the various steps of this scheme, it may be stated in advance that it is only intended for those candidates who have successfully passed the ordinary physical examination, for obviously, except as a matter of scientific curiosity, there is no reason to consume time in giving a physically rejected candidate a mental examination.

The family history is very essential in determining bad heredity in the antecedents and collateral relations of the candidate—an important factor in the etiology of nervous and mental diseases. Of course one or two cases of insanity or epilepsy in an aunt or an uncle, or even a brother or a sister, should not of themselves constitute causes for rejection, but such facts as these should be noted throughout the entire scheme, and then all detrimental facts should be considered together and studied. The case must be viewed in all its aspects, and the medical officer must be the judge as to what weight to assign to each fact elicited, just as he does in his physical examination. An insane mother or an alcoholic father, for example, is a far more important factor than an epileptic grandparent or tubercular aunt, while crime and extraordinary gifts or abnormal traits are often manifestations of mental instability, even though the individuals concerned may never have been considered insane.

The personal history is of more importance than the family history, and it should be gone into quite thoroughly. In it alone the medical officer will frequently find sufficient evidence to warrant the rejection of the candidate. Here again the judicial spirit must be exercised.

We seek information about diseases of childhood, not so much to know what the diseases actually were, but to learn how the candidate reacted to them, and what their after effects were. A history of delirium occurring during, or an unusually long time consumed in recovering from, a disease of childhood, e. g., measles, is at least an indication of an unstable mental organization, and a note should be made of the fact for consideration with other similar evidence which we may elicit.

Severe head injuries often act as a predisposing factor for the subsequent development of mental disorder, when slight stress is furnished as an exciting cause, and therefore a history of their occurrence should be sought.

In accepting a candidate who has had syphilis, the medical officer must remember that even though well treated and apparently cured, he is dealing with a potential general paretic or tabetic patient. Of course these parasyphilitic nervous and mental disorders

occur only in about 1 per cent of those individuals who have had syphilis, but this frequency is sufficiently great to warrant a search for the syphilitic history. It is almost superfluous to remark that no medical officer will enlist a candidate who is in the active stages of syphilis, and who is undergoing treatment for it.

A history of chorea, neuritis, neuralgia or other nervous disease is an evidence of nervous and, potentially, of mental instability.

A consideration of the progress made at school, and the adaptation of the candidate to that environment, will very often furnish evidence of mental inferiority. The pupil who has been stupid at school and did not make the progress which other pupils of his age made, is quite likely to be the "dummy" in the Navy or Marine Corps. On the other hand, the unusually precocious pupil at school is not unlikely to develop into a case of dementia præcox shortly after his entry into the service. Figuratively speaking, these cases of precocious mentality are often the mental fires which burn brightly for a few years and then go out (become insane) as if they are made of straw. So we should be suspicious of the unusually bright or precocious student at school, and look for contributory evidence of mental instability. If none is found, or if insignificant contributory evidence only is found, he may safely be accepted.

The man who was expelled from school on one or more occasions or who was constantly getting into quarrels with his schoolmates, is not apt to prove a desirable man in the naval service.

The candidate should be required to give a connected account of himself, especially of the different kinds of work in which he was engaged since leaving school, up to the time of his appearance at the recruiting station. The time he was employed, the wages received, and the causes for leaving each job are very important elements to consider, because they will often enable us to form a very good idea of the character of the candidate. The man who easily became dissatisfied with his work, or frequently changed his work for something which he thought was better, is very likely to prove to be mentally unstable and unsuitable for the naval service. It is not reasonable to suppose that he is suddenly going to change his habits and be content to serve a four years' term of enlistment without attempting to desert, purchasing his discharge, or in some other way attempting to get out of the service. A man who has frequently been discharged from employment on account of misdemeanors or incompetency is certainly not apt to prove a desirable man in the service, and such a history bespeaks mental inefficiency.

Closely allied to the different kinds of work in which the candidate has been employed is the amount of traveling he has done, and the manner in which he has traveled. From the description of the work and manner of, and motives for traveling, we can generally determine the professional tramps or hoboes.

It goes almost without saying, that the enlistment of alcoholics and drug habitués should be studiously avoided, not only on account of the probability of the subsequent development of psychoses, but also on account of inefficiency and demoralizing effects upon the personnel of the service.

Abnormalities of the sexual life are frequently symptoms of mental disorder, and information along this line should therefore be sought with a view to the exclusion of sexual perverts from the service. This is a most delicate subject and must be handled tactfully or only falsehoods will be elicited.

The examiner's general observations of the candidate are most important. Precocious mentality, extraordinary natural gifts, talents, or abnormal traits should be viewed with suspicion, as they frequently indicate an unstable mental equipment, and their possessors may be quite unable to withstand the stresses of the service without becoming insane. Hobbies and eccentricities are abnormal to a degree which can only be determined in the individual case.

The facial expression is important, but a stupid man sometimes belies his looks, and "things are not always what they seem." Generally speaking, however, it is a fair indicator of the intelligence of the man.

Careless personal habits and slovenly dress usually indicate mental dilapidation, and may be considered a contributory cause for rejection.

Awkward movements, embarrassed and nervous manner, endeavors to conceal information, sullen, unusually timid, excitable, irritable, boastful, or expansive dispositions, are all indications of an unstable mental organization.

Unusually rapid or slow, incoherent or irrational speech, effeminate or defective speech, retardation in speaking, circumstantiality in speech, difficulty in understanding the meaning of questions, and careless or flippant answers to serious questions, are all indications, of variable value, of defective mental organization, and are frequently symptoms of insanity.

In determining the candidate's attitude toward his environment, we seek to discover delusions and hallucinations (especially visual and auditory). The determination of these factors furnishes still more conclusive evidence of actual insanity.

Coming now to the special mental examination, it is important to appreciate at the outset that the special tests which are to be given the candidate are in no sense educational tests, but merely tests of the candidate's memory for remote and recent events, for details, his ability to pay attention, his powers of reasoning and judgment, and his ideation and perception, especially with reference to right and wrong.

The ingenuity of the examiner will readily suggest appropriate questions in geography and history for the purpose of testing the memory of the candidate for past events, e. g., name the longest river in the United States, the capital of the candidate's native State, the capital of the United States, the principal countries and cities of Europe, the approximate dates of some of the most important wars of the United States, some of the most noted Presidents of the United States, etc.

The mental arithmetic tests will give the examiner a very good idea of the quickness of cerebration of the candidate, and in this way aid in determining his mental status. They can also be varied to suit the intelligence and education of the candidate. The tests which are given in the scheme are believed to be the absolute minimum in point of difficulty which should be required of every candidate for any rating.

The stories are designed to test the candidate's ability to pay attention to details, and his ability to paraphrase a story in his own words. Similar stories to those here given have proven most valuable in psycho-analytical work among the insane, and in assisting in the determination of their mental status. It has been found that the dementia præcox case usually misses the important details, and is frequently chiefly impressed by the emotional element. The manic-depressive case, on the other hand, will generally elaborate and add many details. Similar reactions may reasonably be expected from candidates for enlistment, and I feel sure that the manner in which they are repeated by the candidate will frequently be sufficient to convince the examiner that the candidate's mentality is far below par, and that he is not a suitable man for the service.

The reasoning and judgment tests also often demonstrate mental poverty most beautifully, and furnish the examiner additional evidence as to the undesirability of an imbecile or psychopath.

It is difficult to assign a value to the ethical questions, but I am quite convinced that they have a value in determining the candidate's sense of morality. Of course a bright young man will usually be shrewd enough to cover up moral defects which the tests might elicit in men less shrewd. But the bright young man is not the one with whom we are chiefly concerned. The psychopaths and imbeciles will be most likely to react in such a way to the ethical tests that the reaction will furnish contributory evidence of mental and moral inferiority.

It is also difficult to assign a value to the presence of stigmata of degeneration in a candidate. As is well known, they are found in both sane and insane persons, but are much more numerous and more frequent in the latter class. In a study of the facial photographs of 528 cases of insanity in the Navy and Marine Corps, I found anatom-

ical stigmata of degeneration present in 225 cases, or 42 per cent. Capt. Robert L. Richards, Medical Corps, United States Army, in a study of the photographs of 1,072 cases of insanity from the Army admitted to the Government Hospital for the Insane, found that 60 per cent showed stigmata of degeneration in abnormalities of the face, head, and ears. It is generally believed that stigmata of degeneration serve to furnish contributory evidence of mental and nervous instability, and that some stigmata furnish stronger evidence than others. I have been impressed with the frequency of facial and cranial asymmetry, palatal and dental abnormalities, prognathism and opisthognathism, and external aural abnormalities, as well as various psychic and psycho-neurotic stigmata among the insane. For convenience of reference, I have appended to the scheme a list of what I deem the most important stigmata of degeneration which may be found in candidates for enlistment.

Very few fixed rules can be established for the mental examination of candidates for enlistment, and each candidate must be considered individually. With the facts before him, however, which this examination will elicit, I feel sure that any medical officer who has had any experience in recruiting will, even though not an alienist, be able to form an opinion as to the desirability, from a mental standpoint, of any candidate for enlistment. Seldom from one lonely bit of evidence of mental inferiority will he be obliged to form his opinion; a mentally undesirable candidate will generally present, as a result of this examination, an abundance of evidence of his unfitness.

In making use of the scheme for the mental examination of physically accepted candidates, it is not expected that the answers to each question will be recorded—that would take too long—but abnormalities as found should be noted. At the conclusion of the mental examination, the evidence of abnormalities should be viewed as a whole, and a decision reached as to the desirability of the candidate. Not more than one hour need be consumed in conducting this examination, and a desirable candidate should go through it in much less time. To be conservative, I would say that after a slight amount of experience a medical officer may elicit all the important facts in one-half hour.

SCHEME FOR THE MENTAL EXAMINATION OF CANDIDATES FOR ENLISTMENT IN THE UNITED STATES NAVY AND MARINE CORPS.

Why does candidate wish to enter the Navy or Marine Corps? Is explanation plausible? Was he ever in the Army, Navy, or Marine Corps before? If so, how did he get along, and why was he discharged?

FAMILY HISTORY.—*Paternal and maternal grandparents.*—Living or dead? Age? Cause of death in each case? Nervous, mental, and constitutional diseases? [1]

[1] Insanity, epilepsy, chorea, nervous breakdown, chronic headaches, hysteria, other nervous or mental diseases, tuberculosis, and alcoholism (delirium tremens). Any extraordinary gifts, talents, or abnormal traits.

Father and mother.—Living or dead? Age? Cause of death in each case? Nervous, mental, and constitutional diseases? Occupation? Habits (alcohol, tobacco, cocaine, morphine)? Was either a criminal? Nature of crime? Punishment? Did either attempt or commit suicide? If so, under what circumstances?

Uncles and aunts.—How many living? How many dead, and cause of death in each case? Nervous, mental, and constitutional diseases?

Brothers and sisters.—How many living? How many dead? Cause of death in each case? General condition of their health? Nervous, mental, and constitutional diseases? Have any of them been inmates of insane asylums, reform schools, or sanitariums for the treatment of nervous or mental diseases? Are any of them congenitally deformed? Have any of them been considered dull, stupid, feeble-minded, or "queer" at school? Their habits (masturbation, alcohol, and drugs)? Any of them criminals or degenerates? Any of them blind, deaf, or dumb?

PERSONAL HISTORY.—When and where born?

Diseases.—What childhood diseases has candidate had? How long sick in each case? After effects? Convulsions or "fits?" Delirium? Duration of convulsions, "fits," or delirium?

Gonorrhea or syphilis? (if denied, inquire for symptoms of these and treatment). Rheumatism? Chorea ("St. Vitus's dance")? Malaria? Neuritis (neuralgia)? Tuberculosis?

Head injuries.—Severity, operations, effects?

Other accidents requiring operation; recovery?

School life.—Beginning and end? Progress at school in each subject? Bright, average, or stupid? How did he get along with his schoolmates (peaceably, or involved in frequent quarrels)? Why did he leave school? Was he ever expelled from school? If so, why?

Work.—Employment since leaving school? Kinds of work? Time and wages in each job or position? Why did he leave each employment—voluntarily, or was he discharged?

Travel.—How much traveling? In what manner? Why travel to this and that place?

Habits.—Alcohol: Amount and form (beer, whisky, tonic, medicine, etc.)? Amount in day, week, month? How often drunk? Delirium tremens? Periodical sprees? Alcoholic appearance (nervous, coated tongue, splotches on skin, unduly red nose and face, bleary eyes, odor on breath)? Tobacco, opium, morphine, or cocaine habits—form and quantity?

Sexual life.—How many times married? Dates? Wife living? Children? Married life happy or unhappy? Why? Abortions or miscarriages? Knowledge of and character of sexual life? Manner of indulging sexual function (prostitutes, clandestine sexual intercourse, masturbation or other abnormal indulgences)? How often? Venereal disease? Fear of and precautions to avoid? Effect of intercourse? Ashamed or proud to talk about it?

GENERAL OBSERVATIONS.—Does he impress the examiner as being markedly different from other candidates of his age? If so, in what particular? Extraordinary natural gifts, talents, or abnormal traits? Precocious? Bright or stupid? Hobbies? Chief interest? Liking for books (kinds)?

(*a*) Facial expression: Bright or stupid?

(*b*) Personally is he cleanly or untidy? Dress, neat or slovenly?

(*c*) Manner: At ease? Awkward? Easily embarrassed? Nervous? Is he frank? Does he cooperate? Endeavoring to conceal information? Volunteer information?

(*d*) Cheerful or sullen? Anxious? Unusually timid? Easily excited? Irritable? Boastful? Expansive?

(*e*) Does he talk slowly or rapidly? Coherently? Rationally? Prolix?

(*f*) Answer questions seriously? Flippantly? Carelessly? Promptly, or retarded? Directly, or with circumstantiality? Does he readily understand questions?

(*g*) Speech: Stuttering? Other defects? Effeminate? Peculiar? Test phrases: "Statistical," "Third Riding Artillery Brigade," "Methodist Episcopal."

(*h*) Attitude toward environment (including people): Superstitious? Has he ever been wronged, persecuted, or robbed? Delusions or hallucinations evident to the examiner? Does he hear things, noises, or voices? Does he see things? What are they? Does he have strange thoughts? Orders to do things? Act queerly or strangely? Explanations?

SPECIAL MENTAL EXAMINATION.—Examine the candidate in regard to his memory of school subjects, especially geography and history.

Inform the candidate that you are going to give him a number to remember, e. g., No. 375 Oxford Street, and that in five minutes you are going to ask him to tell you what that number is.

Mental arithmetic.—2+4=? 13+6=? 17+3=? 5−2=? 8−5=? 17−4=? 3×2=? 8×7=? 13×3=? 8+2=? 100+4=? 100+3=? etc., etc. Suppose you had 50 cents and spent 12 cents for cheese, 7 cents for butter, and 10 cents for bread, how much change should you receive?

Have the candidate read aloud one of the following stories, and then ask him to give the point in his own words:

(*a*) Once upon a time a gold miner was returning from California with a bag of gold dust in his wagon. He had a very faithful dog with him. Without apparent cause the dog jumped in front of the horses as if trying to stop them and barked violently. The miner tried in vain to quiet the dog, and finally losing patience fired his revolver at him. Stopping to camp, the miner noticed to his dismay that the bag of gold was missing. He immediately retraced his steps. Soon he noticed blood tracks, and following these for about a mile he saw the sack of gold in the middle of the road and near it in a pool of blood lay his faithful dog.

(*b*) The son of a governor of Indiana was first officer on an oriental steamer. When in the Indian Ocean the ship was overtaken by a typhoon and was violently tossed about. The officer was suddenly thrown overboard. A life preserver was thrown to him, but on account of the heavy sea difficulty was encountered in launching a boat. The crew, however, rushed to the side of the vessel to keep him in sight, but before their shuddering eyes the unlucky young man was grasped by one of the sharks encircling the steamer and was drawn under the water, leaving only a dark streak of blood.

(*c*) "A lion, tired with the chase, lay sleeping at full length under a shady tree. Some mice, scrambling over him while he slept, awoke him. Laying his paw upon one of them, he was about to crush him, but the mouse implored his mercy in such moving terms that he let him go. Some time after, the lion was caught in a net laid by some hunters and, unable to free himself, made the forest resound with his roars. The mouse whose life had been spared came, and with his little, sharp teeth gnawed the ropes asunder and set the lion free. 'Little friends may prove great friends.' "

Reasoning and judgment tests.—What is the difference between a horse and an ox? What is the difference between a lie and a mistake? What is the difference between a dwarf and a child? What is the difference between water and ice?

What is meant by the following common phrases:

(*a*) "The early bird catches the worm."

(*b*) "Set a thief to catch a thief."

(*c*) "Burning the candle at both ends."

(*d*) "Honesty is the best policy."

(*e*) "A stitch in time saves nine."

(*f*) "Too many cooks spoil the broth."

Ethical questions.—(*a*) What do you understand as the difference between right and wrong?

(*b*) Why is it wrong to steal?

(*c*) Suppose you wanted very much to go to San Francisco (or any other place) and did not have any money; how would you get there?

Require candidate to write his full name, address, occupation, and the date of the examination.

STIGMATA OF DEGENERATION.—Character? Number? (See list.)

Stigmata of degeneration.

ANATOMICAL.—*Cranial anomalies.*—Asymmetry of cranial bones. Facial asymmetry. Macrocephalus. Microcephalus. Platycephalus. Oxycephalus. Plagiocephalus. Prognathism. Opisthognathism. Abnormally large ears. Abnormally small ears. Rudimentary ears. Ears set too close to head. Ears set too far back. Ears set too low. Excessively long or prominent ears. Lack of bridge of nose. Obliquity of nose. Harelip. Hypertrophied lips. Prominent incisors. Secondary row of teeth. Longitudinal torus palatinus. Defective palatal suture. Flattened palate on one side. Palate too deep and narrow. Palate too flat. Absent wisdom teeth. Irregular teeth. Too large mouth. Too small mouth. Orbits set far apart. Fixed look—glassy stare. Projecting forehead. Receding forehead.

Anomalies of the trunk, limbs, and general structure.—Absence of hair in men. Premature grayness. Hypertrichosis (superfluous hair). Glabrous chin (no beard). Canities. Albinism. Unusually fair complexion. Feminism in men. Disproportionate length or breadth of trunk. Disproportionate length of limbs. Thoracic asymmetry. Lordosis. Scoliosis. Prolonged coccyx. Rudimentary tail. Spina bifida. Mammary development in males. Undescended testicle. Undeveloped testicles. Pigmented spots on skin. Absence of nails or fœtal state of nails. Asymmetrical fingers. Polydactyly. Syndactyly. Ectodactyly.

PHYSIOLOGICAL.—Left handedness. Tremors. Nystagmus (congenital). Tics. Nyctalopia (night blindness). Hemeralopia (day blindness). Daltonism (color blindness, achromatopsia). Concentric limitation of the visual field. Defective speech. Stammering. Stuttering. Merycism (gluttony). Rumination. Uncontrollable appetites (food, liquor, drugs). Coldness of extremities. Flushing of extremities. Weak digestion. Constipation. Low arterial tension. General chills and flushes.

PSYCHIC AND PSYCO-NEUROTIC.—Phobias. Psychopathic endowment. Invalid habit. Feeble-mindedness. Eccentricity. Moral delinquency. Sexual perversion. Precocity. Overdevelopment of certain aptitudes. Ideo-obsessive constitution. Abnormal imagination. Great credulity. Great irritability. Excessive anger. Compulsions. Hysteria. Hypochondria.

THE RECENT OUTBREAK OF CHOLERA IN ITALY.

By Asst. Surg. C. J. HOLEMAN, United States Navy.

The following is a brief sketch of the recent epidemic of cholera in and about Naples, Italy, on account of which the itinerary of the U. S. S. *Wheeling* and U. S. S. *Petrel* was changed and Genoa and Villefranche were visited instead of Naples.

During August, 1910, there were reported numerous deaths from gastroenteritis in Naples, this affection being extremely severe and showing a death rate of about 80 per cent. The course of many

of these cases was extremely rapid, reaching a fatal termination in one day or less.

On the 19th of September a large number of people was gathered in the city to celebrate the feast of San Gennovo—the patron saint of Naples. If on this occasion a vial of blood of that saint, preserved in one of the cathedrals and produced at the feast, liquefies, it indicates five years of prosperity for the city. This time the blood is said to have liquefied, thus giving rise to universal rejoicing with feasting and drinking. During this time large quantities of fruit were consumed, probably much of it unsound—at best consumed uncooked or even unwashed—hence it is not strange that five days later a marked increase in the deaths from gastroenteritis occurred. A contributing factor, probably of no small importance, was a considerable rainfall during the feast so that the soil in many of the dirty, narrow streets was reeking with filth as, it is said, the citizens defecate rather promiscuously in alleyways and about the streets.

At this time the first case of cholera was announced and after that day the deaths from cholera increased until a maximum of 12 *per diem* was reached. This rate has since lowered considerably, yet on the 11th day of this month [October] 5 new cases and 13 deaths were reported.

The epidemic was imported into Naples from the Adriatic coast, where a number of towns in Apulia—particularly Margherita di Savoia, Bari, and the intermediate coast towns, also Cerignola and Foggia (all of these except Cerignola being in direct railroad connection with Naples)—were infected. The carriers are supposed to have been emigrants passing from these towns to the port of Naples for embarkation.

Aside from these Apulian towns the disease has appeared sporadically in Caserta and Aversa, in Campania, on the above-mentioned railway line. In the latter place the cases have been confined to the insane asylum, and their control has been extremely difficult. A few cases have been reported from Palermo, but here the disease is believed to have been stamped out. Rome has also been visited, but no foothold was obtained there. Genoa has been entirely free—of 3 cases developed while en route from Naples to this city, 1 died during the journey and the others were promptly sent to a hospital for contagious diseases on a near-by island. A strict quarantine against Greece, Roumania, Austria, Russia, and the Balkan States, also against Palermo and Naples, is maintained here.

I have been unable to obtain data concerning methods followed in Apulia for preventing the spread of the disease. In Naples the dead are buried immediately; patients are promptly sent to isolation hospitals, "contacts" placed under observation in hospitals,

and houses and contents thoroughly disinfected with bichloride solution. The water supply is believed to be above reproach.

The local health authorities at this place could not advise accurately as to the quarantine regulations on the east coast of the peninsula, but stated that they probably included the above-mentioned countries. It is believed that the disease entered Italy at Bari, being brought there by a band of Russian gypsies. As a result of this wanderers and vagrants are closely watched, though it is thought that despite these precautions the first cases appearing in Rome were taken there by prostitutes.

For all information included in this report the writer is indebted to Surg. King of the United States Public Health and Marine-Hospital Service and the local health authorities at Genoa.

UNITED STATES NAVAL MEDICAL SCHOOL LABORATORIES.

THE UNITED STATES NATIONAL MUSEUM IN ITS RELATION TO OTHER GOVERNMENT SCIENTIFIC COLLECTIONS.

By Passed Asst. Surg. P. E. GARRISON, United States Navy.

It may be noticed that the last previous additions to the helminthological collection of the Naval Medical School, as published in the October Bulletin, were numbered 124 to 150, while the additions reported in the present issue begin with the number 19651. The explanation lies in the fact that in the interim the helminthological collection at the school has been placed in the National Museum series and has been assigned National Museum helminthological collection numbers, beginning with 19501.

This step had been contemplated from the beginning as one which might be taken after the collection had reached greater size and importance. The custodian of the National Museum's helminthological collection (Dr. Stiles) called attention to the fact that such delay would involve a duplication of numbers, which always opens the possibility of more or less confusion and chance of error, so that upon his suggestion it was decided to place the collection in the National Museum series at once in order that specimens may be given their National Museum numbers at their original entry.

It is not generally recognized that the National Museum is already designated by law as the ultimate repository for all Government scientific collections, it being expressly stipulated (sundry civil act, Mar. 3, 1879) that all such collections shall be deposited in the National Museum when no longer needed by the Government official or institution holding them. While, so far as we are aware, no definite ruling has been made in any particular case, it is very probable that under the law no Government official or institution has a right to retain indefinitely scientific specimens which come into his or its possession in the Government service.

It is, therefore, merely a matter of reasonable foresight to anticipate the eventual combination of all Government scientific collections in

the National Museum by providing numbers for the various collections in the one series, and such has been the policy followed out as far as possible by the custodian of the helminthological collection. In addition to the helminthological collection of the National Museum itself, the parasite collections of the Bureau of Animal Industry of the Department of Agriculture, the Hygienic Laboratory of the Public Health and Marine-Hospital Service, and now the Naval Medical School are using numbers in the National Museum series. It may be said further that the National Museum furnishes an accession catalogue properly ruled and numbered, and that the collection remains intact for the use and under the complete control of the institution holding it until such time as the institution may desire to transfer it, in whole or in part, to the National Museum.

While the Naval Medical School placed its helminthological collection in the National Museum series with a view to a possible future transfer of the collection to the National Museum, as provided by law, it was actuated more strongly by a desire to place itself in line with a policy of closer and more systematic cooperation between institutions engaged in scientific work along the same lines. There can be no question that it would be highly advantageous, especially with a view to the future development of the different medical sciences, if all of our Government scientific collections were centralized in some such way as is being done in helminthology; and if the same system could be extended to include State and private institutions, it would seem that the benefits would be correspondingly increased. The advantages in such centralization are numerous and far-reaching, but may be summarized under the following heads:

(1) It gives better assurance of the perpetual preservation of scientific specimens.

(2) It tends to bring together eventually for comparative study scientific specimens collected from different localities and described by different workers.

(3) It would bring the custodians of the various collections into closer touch and would facilitate the exchange of specimens.

(4) It would place American collections individually and collectively upon a better footing with foreign scientific museums.

(5) In general, by preserving material in a central collection it would provide the means for a better and more consistent progress of scientific knowledge in a given line throughout a long course of years, enabling future workers to refer directly to all the material which has been the actual basis of earlier work.

SPECIMENS ADDED TO THE HELMINTHOLOGICAL COLLECTION, UNITED STATES NAVAL MEDICAL SCHOOL, JUNE-AUGUST, 1910.

Accession No.	Name.	Host.	Collected by or received from—
19651	*Schistosoma mansoni* (ova)	*Homo*	Stalnaker and Shephard, Culebra, P. R.
19652	do	do	Ashford and Kennedy, San Juan, P. R.
19653	*Uncinaria*	do	Do.
19654	*Taenia saginata*	do	R. E. Riggs, Port Royal, S. C.
19655	*Trichuris trichiura*	do	Bureau of Science, Manila.
19656	*Taenia saginata* (head)	do	Do.
19657	*Taenia saginata* (segments)	do	Do.
19658	*Dipylidium caninum*	(?)	Do.
19659	*Trichinella spiralis*	*Mus*	P. E. Garrison, District of Columbia.
19660	*Dicrocoelium lanceatum*	(?)	(?)
19661	do	(?)	(?)
19662	*Clonorchis sinensis*	(?)	(?)
19663	*Opisthorchis felineus*	*Felis domestica*	Bureau of Science, Manila.
19664	*Necator americanus*	*Homo*	C. S. Bungart, Mexico.
19665	*Agylostoma duodenale*	do	Do.
19666	Ova: *N. americanus, A. duodenale, T. trichiura.*	do	Do.
19667	*Ascaris lumbricoides*	do	Stalnaker and Shephard, Culebra, P. R.
19668	*Bilharzia* (urine)	do	London School of Tropical Medicine (J. F. Leys).
19669	*Bothriocephalus* (ova)	do	Do.
19670	*Taenia saginata* (ova)	do	Do.
19671	Liver fluke	Sheep	Do.
19672	*Cysticercus cellulosae*	Hog	Dr. Allen J. Smith, University of Pennsylvania.
19673	Nematode	*Mus decumanus*	Garrison and Avery, District of Columbia.
19674	Ova	do	Do.
19675	*Trichinella spiralis*	do	Do.
19676	*Trichosoma*	do	Do.
19677	*Trichinella spiralis*	*Mus*	Do.
19678	*Necator americanus* (ova)	*Homo*	R. M. Kennedy, San Juan, P. R.
19679	Ova: *Schistosoma mansoni, Necator americanus, Trichuris trichiura.*	do	Stalnaker and Shephard, Culebra, P. R.
19680	*Ascaris lumbricoides*	do	P. R. Stalnaker, Culebra, P. R.
19681	*Trichinella spiralis* (adult)	White rat	Garrison and Avery, District of Columbia.
19682	*Trichinella spiralis* (embryo)	do	Do.
19683	*Ascaris canis*(?)	*Canis familiaris*	1910-11 class, school.
19684	Tapeworms	do	Do.
19685	Roundworms	do	Do.
19686	*Dipylidium caninum*	do	Do.
19687	Tapeworm	do	Do.
19688	Hookworm (?)	do	Do.
19689	*Filaria* (embryos)	do	Do.
19690	*Hymenolepis nana* (adult)	White rat	Garrison and Avery, District of Columbia.
19691	*Hymenolepis nana* (cercocystis)	do	Do.
19692	*Trichinella spiralis* (embryos)	do	Do.
19693	*Filaria* (?)	*Canis familiaris*	1910-11 class, school.

RECENT ADDITIONS TO THE PATHOLOGICAL COLLECTION, UNITED STATES NAVAL MEDICAL SCHOOL.[1]

Most of the diagnoses given in the following list were made either by Surg. C. S. Butler or Passed Asst. Surg. O. J. Mink or by the person sending the specimen. In many cases they are merely provi-

[1] The systematic cataloguing of the pathological specimens is not yet completed and some very interesting material received recently has not been entered, but will be acknowledged in a later list. The members missing in the present list of additions belong to specimens which have been at the school for a long time, but have not before been entered in the catalogue. A number of miscellaneous specimens such as snakes, bugs, insects, etc.—have been received and will be published in the Bulletin as soon as their classification is finished.

sional or approximate, and in no case should the diagnosis given be considered in the light of an official report upon the specimen, all such reports being made directly by letter.

Accession number.	Tissue.	Diagnosis.	Collected by or received from—
329	Appendix and adjacent gland.	Chronic sclerosing appendicitis	Wm. D. Owens, Naval Hospital, New York.
330	Lung	Emphysema; broncho-pneumonia	W. S. Pugh, Naval Hospital, New York.
	Brain	(?)	
	Liver	Bile pigment	
331	Brain	(?) Normal	Raymond Spear, Naval Hospital, Washington.
332	Ovaries	(?)	No data.
333	Spleen and bubo of squirrel.	Plague	Dr. G. W. McCoy, San Francisco.
334	Tumor	Lipo-fibro-sarcoma	Dr. A. S. Warthin, Ann Arbor, Mich.
335	do	Fibroma molle	Do.
336	do	Fibroma dura	Do.
337	do	Lipoma	Do.
338	Tumor (leg)	Myxoma	Do.
339	Chondroma (parotid)		Do.
340	Tumor	Neuroglioma ganglionare	Do.
341	do	Rhabdomyo-sarcoma	Do.
342	Tumor (breast)	Adenoma simplex	Do.
343	Tumor	Hyaline myo-fibroma	Do.
344	Tumor (testicle)	Teratoma testis	Do.
345	Tumor (ovary)	Teratoma	Do.
346	Tumor (inter- and intracanal).	Adeno-fibroma	Do.
347	Tumor (intracanal)	do	Do.
348	Tumor	Lympho-sarcoma	Do.
349	do	Small spindle-cell sarcoma	Do.
350	do	Polymorphous cell myxochondro-sarcoma.	Do.
351	do	Large spindle-cell sarcoma	Do.
352	do	Osteochondroma	Do.
353	Tumor (breast)	Cyst adenoma, becoming carcinoma.	Do.
354	Tumor	Melanotic sarcoma	Do.
355	do	Angio-sarcoma	Do.
356	Kidney	(?)	London School Tropical Medicine (J. F. Leys).
357	(?)	*Leishmania donovani*	Do.
358	Liver	Coccidiosis	Do.
359	Lung	Filariasis	Do.
360	Spleen	Beri-beri	Do.
361	Brain	Malaria	Do.
366	Eyeball	Injury	E. M. Shipp, Naval Hospital, Washington, D. C.
367	Vocal cord	Syphilis	G. F. Cottle, Tutuila, Samoa.
458	Bursa	Tuberculosis	R. C. Persons, Naval Hospital, Philadelphia.
459	Skin	Yaws	Wm. H. Bell, Colon Hospital.
460	do	(?)	(?).
461	Lung	Broncho-pneumonia	O. J. Mink, Naval Medical School.
462	do	do	Do.
	Intestine	Adeno-carcinoma	Do.
	Aorta	Arterio-sclerosis	Do.
	Kidney	(?)	Do.
	Liver	(?)	Do.
463	Brain	Pneumococcus meningitis	Wm. H. Bell, Colon Hospital, Panama.
	Lung	Pneumonia	
	Heart	Thrombus	
464	Lungs	Infarct, congestion	O. J. Mink, Naval Medical School.
	Heart	Hypertrophy	Do.
	Pericardium	(?)	Do.
	Kidney	Atrophic, acute parenchymatosis	Do.
465	Liver	Normal	Do.
	Spleen	Acute congestion	Do.
466	Brain of calf	Hydrophobia	Dr. A. M. Stimson, Hygienic Laboratory, United States Public Health and Marine-Hospital Service.

FIG. 1.—FLY-PROOF GARBAGE CAN HOLDER CLOSED.

FIG. 2.—FLY-PROOF GARBAGE CAN HOLDER. GARBAGE BEING DEPOSITED.

FIG. 3.—FLY-PROOF GARBAGE CAN HOLDER. GARBAGE BEING REMOVED.

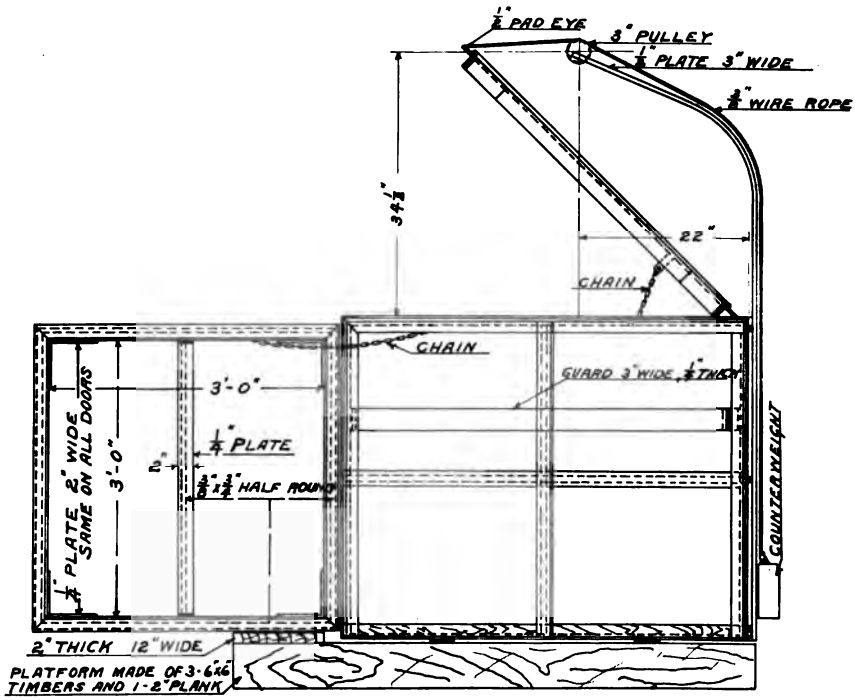

FIG. 4.—DRAWING SHOWING TOP AND SIDE DOORS, DIMENSIONS, ETC., OF FLY-PROOF GARBAGE CAN HOLDER.

SUGGESTED DEVICES.

A SANITARY GARBAGE-CAN HOLDER.

By Hosp. Steward H. C. KELLERS, United States Navy.

The accompanying plan and photographs represent a sanitary garbage-can holder designed by me and constructed at this hospital (United States Naval Hospital, Puget Sound, Wash.). The temporary holding of garbage and kitchen refuse, while awaiting removal is generally unsatisfactory. Even when the covered cans are used they are frequently placed in some out-of-the-way corner, thus establishing a breeding place for flies or rats, because the covers are often left off or the garbage is spilled while being deposited.

The suppression of the fly nuisance with its attendant dangers, and the prevention of the scattering of putrescent material by rats, cats, and other animals, are so important that any appliance suppressing or checking these conditions is worthy of consideration. We feel that this device will effectually prevent the above-mentioned nuisances. The holder is constructed as shown on the plan, of angle iron, quite heavy to withstand rough usage. The wire mesh can be readily renewed when torn or worn, as the iron molding holding it is secured by machine screws. The cover is made in two sections, each fitted with counter-weights for sustaining the weight of the hinged covers when the holder is opened.

The front is in two sections, hinged for the purpose of facilitating the removal or insertion of the cans.

The holder when built to the dimensions shown on the plan will contain six standard garbage cans.

The general appearance of the holder is not unsightly. It may be placed in a conspicuous position without offending one's aesthetic sense.

This holder allows a free circulation of air in and about it and facilitates daily inspection.

THE BLANKET SPLINT.

By Assist. Surg. F. X. KOLTES, United States Navy.

This improvised appliance has been found so useful in both civil hospital and naval practice that, in my opinion, it merits description. It is made as follows:

Depending upon their thickness, two or three blankets are folded in such a way as to form a strip, the width of which corresponds to the length of the intended splint. (If for a fractured leg, the distance from 4 inches below the heel to 6 inches above the knee.) The strip is rolled from both ends about pieces of broom handle which serve to give rigidity, the rolls meeting in the center and being of equal diameter (fig. 1). The apparatus is turned over, the rolls separated a little, allowing the intervening portion to sag, thus forming a kind of hammock. The splint is applied as follows:

An assistant raises the limb (the leg in this case) to a considerable angle, while under it are laid, transversely, pieces of wide muslin bandage about 4 feet long. The splint is then placed upon the strips, the injured member is laid upon the "hammock" (fig. 2), and, depending upon the diameter of the limb at the point of apposition, the rolls are separated or folded in as necessary, so that they may be everywhere firmly applied to the sides, and that the leg may everywhere rest upon the hammock. While the surgeon holds the limb securely within the splint, the assistant brings the muslin strips around and ties them firmly in front, one below the heel, one below the knee, one above the ankle, and one above the knee, some cotton being inserted underneath for padding, if necessary. The strip below the heel serves to keep the foot at proper flexion and it may be supplemented by a piece of cardboard as shown in figure 3, which represents the splint in place. In cases where the blankets are likely to become soiled with discharges, a piece of rubber sheeting may be employed.

The advantages of this apparatus are:

1. The materials necessary are likely to be always at hand.
2. It is easily applied.
3. It gives good immobilization.
4. It admits of ready readjustment, to allow, firstly, for swelling, secondly, if the fracture be compound, for a change of dressing.
5. It is especially suitable in cases where transportation of the patient is necessary.

This splint is not to be regarded as permanent, but rather as one which may be employed during the first week or two following the injury, while swelling or an open wound is present; then it is to be replaced by some more permanent form of fixed dressing.

FIG. 1.—BLANKET SPLINT BEING ROLLED.

FIG. 2.—BLANKET SPLINT BEING APPLIED.

FIG. 3.—BLANKET SPLINT—APPLICATION COMPLETED.

FIG. 1.—VEIN-TO-VEIN TRANSFUSION (FAUNTLEROY). SEE PAGE 47.

CLINICAL NOTES.

REPORTS OF FOUR TRANSFUSIONS BY THE VEIN-TO-VEIN METHOD WITH CURVED GLASS TUBES.

By Surg. A. M. FAUNTLEROY, United States Navy.

In the Medical Record (New York) for September 3, 1910, the technique for the vein-to-vein method of transfusion with curved glass tubes is set forth. In introducing these tubes to the profession I felt some misgivings at that time as to what would be the final verdict. Since the publication of the above article the tubes have had an extensive trial by several surgeons, all of whom report most favorably as to the general result obtained. In only one instance that I know of was there anything like a failure. In this particular instance, that of a girl aged 14 at the Jefferson Hospital, the tube worked well for 15 minutes, then the blood clotted and the tube had to be removed. The clotting of the blood was due to failure to use a rubber tourniquet on the donor's arm. Only a piece of gauze was used, and as the tissues contracted or condensed under the gauze the latter remained stationary and did not continue to constrict the arm as a rubber tourniquet would have done. The use of the rubber tourniquet around the donor's arm throughout the operation is a very important factor in the successful use of the tubes. It should be adjusted sufficiently tightly to secure a well-marked venous hyperæmia in the forearm, with a consequent increase of venous pressure, which latter is amply sufficient to force the blood continuously through the tube. This tourniquet should not be so tightly applied as to obliterate the donor's radial pulse.

As a full description of the technique, with illustrations, has already been published, as indicated above, only the results of the transfusions will be given below. As a possible modification of the tubes, Dr. Klopp, chief resident at the Jefferson Hospital, Philadelphia, who has used the tubes successfully a number of times, suggests that the U-shaped or hand-to-shoulder tube be made so that the two ends are slightly bent toward each other like a horseshoe and not in a continuous curve, as now made. This may be of practical advantage, but I have never had any trouble in using the tubes as given in the published technique.

Transfusion No. 1.—D. M., chief boatswain, United States Navy. White. Age, 43 years and 6 months. Admitted United States Naval Hospital, Philadelphia, July 3, 1910, with a diagnosis of chronic hepatitis. Case paper No. 186. History of repeated malarial attacks beginning in 1898 and during most of these attacks parasites have been demonstrated in his blood, although there is no record at hand giving the species of malarial parasite found. He has been invalided several times on account of malarial cachexia. On admission no parasites could be found after repeated and careful blood examinations. Liver somewhat contracted, but no ascites or localized œdema present. Spleen slightly enlarged. Tongue large and flabby, and the skin and conjunctivæ have the muddy, light saffron color of the malarial cachectic. Heart, lungs, and kidneys apparently normal, though later a hæmic murmur developed from the progressive anæmia. Cammidge reaction and fæces negative. Anorexia, constipation, insomnia, vertigo, and indigestion are complained of as prominent symptoms with an occasional headache in the evening. Examination of stomach contents showed no free HCl, and there was a total acidity of 8. No lactic acid or Opler-Boas bacilli present. On July 14, 1910, the record shows that the patient not only showed no improvement under medical treatment, but his condition had become progressively worse. At this time the red count was 1,110,000 per cubic centimeter and the hæmoglobin 28 per cent. Differential count showed polymorphonuclears 56 per cent, small lymphocytes 28 per cent, large lymphocytes 14 per cent, and eosinophiles 2 per cent. Poikilocytosis and basic degeneration of red cells marked. No nucleated reds or other pernicious cellular elements were demonstrated after repeated examinations, although three months after this record started large nucleated reds began to show themselves in small numbers.

On July 18 patient became much weaker. Red count remained about the same and hæmoglobin was 26 per cent. On July 19 transfusion was decided upon and a vein-to-vein anastomosis effected with a glass tube and kept up for 30 minutes. Patient showed remarkable and progressive improvement on the table and, at the end of the operation, wanted to walk to his room, although he could hardly raise his hand before the transfusion had been done. After operation the red count showed 3,980,000 per cubic centimeter, and hæmoglobin 90 per cent. On account of the very warm and humid condition of the atmosphere the patient began to lose ground about a week after operation and on August 1 the red count was 1,980,000 per cubic centimeter and the hæmoglobin 40 per cent. It was decided that he be transferred to the cooler climate of Portsmouth, N. H., and, in order that he might stand the trip, another transfusion was done.

Transfusion No. 2.—This was performed on August 2 and the red cells brought up to 3,130,000 per cubic centimeter and the hæmoglobin to 80 per cent. The donor for the first transfusion became noticeably weak at the end of 30 minutes, showing that he had given up a large quantity of blood. The shoulder-to-shoulder tube was used for the first operation and the hand-to-shoulder for the second. Patient returned to Philadelphia on October 25, feeling comparatively strong and well. Nucleated cells in small numbers now began to be seen in his blood. Blood platelets were increased and basophilic degeneration marked. Red count 2,500,000 per cubic centimeter and hæmoglobin 59 per cent. White cells 7,500. No unusual white cells present.

The immediate result in this particular case is that the patient's life is prolonged for a certain time yet undetermined. The ultimate result is still problematical. Certain it is that if life can be prolonged one, two, or three years by transfusions the operation should be performed as often as indicated by the patient's condition. It is yet a mooted point as to whether transfusions cause any permanent blood change for the better. It has not been done often enough in the same individual to hazard a trustworthy opinion.

Transfusion No. 3.—C. N. S., electrician first class, United States Navy. White. Age 23 years and 1 month. Admitted United States Naval Hospital, Philadelphia, October 21, 1910, with a diagnosis of pernicious anæmia. Case paper No. 295. The patient's hospital ticket states that he was in excellent health up to September 5 when he presented himself with a trifling infection of the forearm, which gradually assumed a carbuncular appearance. Shortly after this the temperature suddenly rose to 105° F., and for several days an apparently profound septic condition ensued. Under ether the forearm was incised, and although no pus was found there was more or less widespread necrosis. Gradual improvement followed the operation, with an occasional evening rise of temperature. At this time the red count was 1,600,000 per cubic centimeter, hæmoglobin 35 per cent, and color index 1+. He was put on the usual medical treatment.

On admission to this hospital the patient, who is pronounced blonde, presented the general appearance of grave hæmopoietic dyscrasia. Red count 1,200,000 per cubic centimeter and hæmoglobin 35 per cent. Marked poikilocytosis, relative increase of lymphocytes, and nucleated reds both large and small. Color index 1+. Impaired vision is complained of and examination of eye grounds shows many punctiform retinal hemorrhages. Heart, lungs, and kidneys apparently normal. Gums spongy with slight oozing of blood. The usual medical treatment was instituted, but the patient became progressively

worse, the bleeding from the gums being at times marked. On October 30 the red count was 604,000 and there was considerable bleeding from the gums. Patient was very weak and dyspnœa marked. Transfusion was decided upon and a vein-to-vein anastomosis performed with the shoulder-to-shoulder tube. There was a marked change in patient's condition while on the table. The hemorrhage from the gums stopped completely; cheeks, ears, and lips began to redden; dyspnœa passed away and patient stated that he felt much stronger. The anastomosis was kept up for 19 minutes and would have been kept up longer but for the weak condition of the donor. Patient got off the table with 3,400,000 red cells per cubic centimeter.

On November 11 the bleeding from the gums began again and patient was given an injection of horse serum in the shape of 3,000 units of diphtheria antitoxin, which caused the bleeding to stop almost immediately. This was repeated three days later on account of the bleeding, with the same result. On November 18, the bleeding from the gums being profuse and the patient in a very weak condition, another transfusion was decided upon. At this time the red count was 652,000 per cubic centimeter.

Transfusion No. 4.—The same donor was used, and the anastomosis kept up for 20 minutes. A smaller vein in the donor's arm was used at this time and the patient's red cells brought up to 1,520,000 per cubic centimeter. There was even more marked improvement after the second transfusion than after the first. The bleeding stopped immediately and patient said he felt better than he had at any time since admission. At the time of this report (one week after last transfusion) patient has gained considerable strength and, though his red cells remain around 2,000,000 er pcubic centimeter, the hæmolytic condition seems to have been controlled, as no hemorrhage has occurred and he takes the air every day in a wheel chair.

The marked hæmolytic condition present in this case is of course a very serious factor, and the prognosis correspondingly grave, but it is believed that one or two more transfusions, if necessary, will so improve the condition that the patient may be able to get about again. Of the photographs accompanying this paper, one shows the hand-to-shoulder and the shoulder-to-shoulder tube and the other shows the actual operation in transfusion No. 4, in which the shoulder-to-shoulder tube was used. In selecting the tube to be used in any particular case one will have to be guided by the position of the veins at the elbow or elsewhere, but, other things being equal, it is believed the shoulder-to-shoulder tube is the tube of choice.

FIG. 2.—FAUNTLEROY'S GLASS TUBES FOR VEIN-TO-VEIN TRANSFUSION. SHOULDER-TO-SHOULDER TUBE ABOVE AND ARM-TO-SHOULDER TUBE BELOW.

FIG. 1.—BILATERAL INGUINO-SUPERFICIAL HERNIA WITH BILATERAL UNDESCENDED TESTICLE. BEFORE OPERATION. (CURL'S CASE.) SEE PAGE 51.

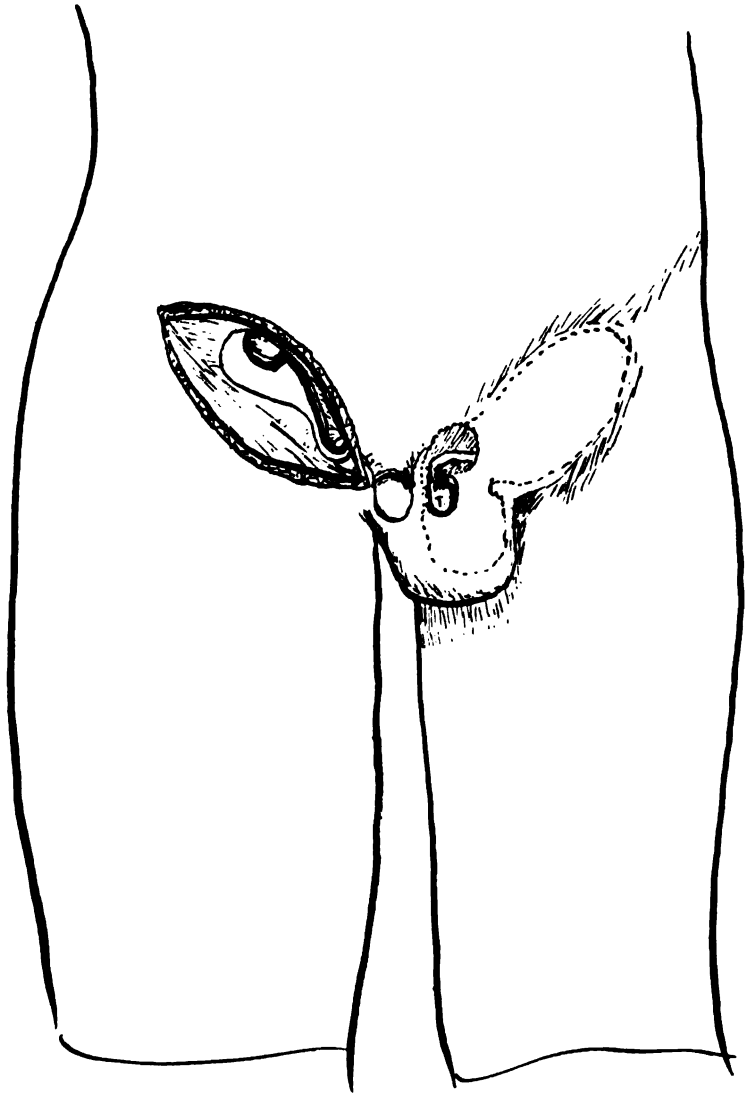

FIG. 2.—BILATERAL INGUINO-SUPERFICIAL HERNIA WITH BILATERAL UNDESCENDED TESTICLE. SKETCH SHOWS LOCATION OF TESTICLE AND SAC ON RIGHT SIDE AND OUTLINE OF DOUBLE SAC ON LEFT SIDE WITH TESTICLE AT RING. (CURL'S CASE.)

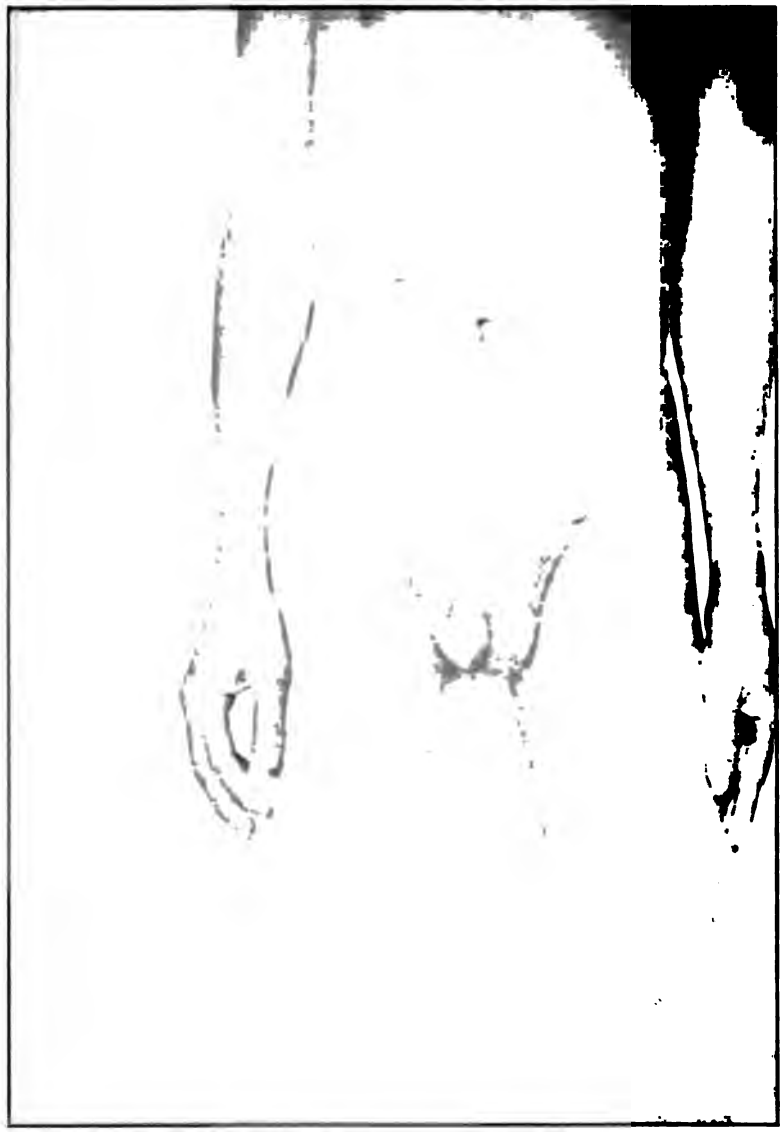

FIG. 3.—BILATERAL INGUINO-SUPERFICIAL HERNIA WITH BILATERAL UNDESCENDED TESTICLE. AFTER OPERATION. (CURL'S CASE.)

BILATERAL INGUINO-SUPERFICIAL HERNIA WITH BILATERAL UNDESCENDED TESTICLE.

By Surg. H. C. CURL, United States Navy.

This case is briefly reported because of its evident rarity. (See Keen's System of Surgery.)

Patient is a Filipino, aged 30, married, but with no children. On inspection his condition is as shown in photograph "Fig. 1." On left side a large bilocular hernia, the outer sac extending for 3½ inches outward along Poupart's ligament, superficial to the aponeurosis of the external oblique, the inner sac extending a short distance down into the scrotum and the testicle resting at the external ring. The hernia was a typical congenital one and the ring was 1½ inches in diameter.

On the right side the vaginal process had apparently passed out of the canal and then, instead of going down into the scrotum, had turned acutely upward and outward for 3 inches beneath the deep fascia and superficial to the external oblique muscle. (Fig. 2.)

The special point of interest on this side was that the sac contained the right testicle (at a point indicated by the cross in photograph).

The process had not closed at the internal ring and was patent throughout. Both testicles were atrophied.

A modified "Bevan" operation for undescended testicle was performed on both sides, and right side was closed by the Bassini method.

On left side the cord was so short that a Ferguson closure was done, a flap from the sheath of the rectus being used to strengthen the wall.

LARVÆ IN THE DEEP URETHRA AND BLADDER.

By Passed Asst. Surg. H. F. STRINE, United States Navy.

F. J., a civilian employed at the United States naval station, Olongapo, P. I., reported at the sick quarters for treatment February 10, 1910, complaining of abdominal cramp. During that night the pain subsided and he slept well. The following morning the abdominal pain became very severe; nausea was present with vomiting and general abdominal rigidity. Bowels open, voided urine at 8 a. m.

He was transferred to the U. S. S. *Relief* at 3 p. m. Upon admission he had a temperature of 99.4° F., general abdominal rigidity—boardlike over bladder. Pain and tenderness over bladder and stomach.

A sterile (previously boiled) hard rubber catheter was passed into the bladder meeting some yielding obstruction in the deep urethra. About 150 cubic centimeters of clear urine were withdrawn, which contained numerous actively motile larvalike organisms. Feces negative. The urethra and bladder were then thoroughly irrigated

with potassium permanganate and boric acid solution. At 7 p. m. the symptoms had subsided to those of a mild case of acute cystitis. Two hundred cubic centimeters of urine withdrawn contained a few dead, but no living, organisms. Patient complained of exquisite tenderness on passing the catheter through the deep urethra and sphincter.

Two days later all signs of bladder irritation had disappeared. Urine passed clear and free from larvæ. Patient was discharged to duty February 14, 1910.

In this case there was no history of disease of the urethra or rectum prior to onset of symptoms on February 11. Anterior urethra was normal. Evidently the eggs were deposited and developed in the deep urethra, the larvæ passing through the bladder sphincter and there setting up acute inflammation of the bladder.

The larvæ could not be identified. Unfortunately no effort was made to develop them.

AN EXTENSIVE RAZOR WOUND OF THE THROAT.

By Passed Asst. Surg. W. G. Farwell, United States Navy.

Shortly before midnight on June 7, 1910, I was called to the lighthouse at the entrance to Guantanamo Bay, Cuba, to attend one of the lighthouse keepers, who had been injured by one of his companions during a drunken brawl.

It took over half an hour to reach the lighthouse, a distance of nearly 3 miles over a rough and hilly road, and upon my arrival, A. D., a well-built man aged 33 years, was lying on a cot with a large wad of absorbent cotton stuffed into a gaping razor wound of his throat. The wound extended from ear to ear, beginning just beneath the angle of the jaw on the right side, the razor severing the skin, superficial fascia, platysma muscle, and superficial vessels. The wound continued downward and to the left and ended well back into the posterior triangle of the neck. The thyroid cartilage in the mid line was nicked. The left external jugular vein, and the sterno-mastoid muscle at its middle third were severed.

Hemorrhage had been very profuse, the floor, mattress, and bedding being covered with blood, which was still oozing from the severed jugular vein; the man was practically exsanguinated, no radial pulse palpable, and in a condition of marked shock.

The wound was closed as rapidly as possible with a dozen interrupted silk sutures, the severed vein ligated, the cut ends of the sterno-mastoid united, and the patient vigorously stimulated.

Several hours later, when the patient had begun to respond to the stimulation, he was placed in a wagon, hauled 3 miles over a road so hilly in places that the rear wheels had to be locked when going

downhill, was then transferred to a gasoline launch, and carried 3 miles farther to the U. S. S. *Newark*.

The hemorrhage had ceased when the wound was closed, but recommenced shortly after the patient was placed in the wagon, due either to the rough jolting he received, or the increase in blood pressure from stimulation; this ceased, however, when he was placed in bed on the U. S. S. *Newark*, and did not recur.

The patient was kept in bed for six days, but as a lighthouse tender was sailing for Key West the following day he was transferred to that vessel and reached Key West safely, although not in a fit condition to travel. I have since heard from authentic sources that he has recovered entirely.

This case is of interest in that the man should survive (due in great part to his fine physique and vitality) for more than half an hour with continuous hemorrhage from an external jugular vein.

No infection developed, although the wound was closed very hastily with only a pocket case of instruments and by the aid of a kerosene lamp, the light of which attracted countless flying insects, which were continually crawling over the wound and instruments, despite every effort to prevent them. Assistance was rendered by a private marine whose medical experience was limited to having formerly been an undertaker.

REPORT OF TWO CASES OF HEAT CRAMPS ON U. S. S. "CHARLESTON."

By Passed Asst. Surg. H. A. MAY, United States Navy.

Case 1.—G. G. G., fireman, second class, white, aged 24 years, native of Illinois. A tall, thin man, with very fair skin, light blue eyes, and yellow hair. The appearance of lips, finger nails and eyelids suggests anemia. He does not use alcoholic liquors, smokes but little, and does not chew tobacco. His health has always been good, and no tubercular or syphilitic history can be elicited. He never becomes seasick, and at all times his bowels, kidneys, and skin act freely, especially so during steaming watches at sea.

The ship left Yokohama at noon of January 21, and G. stood his regular watches without trouble until about 5 o'clock a. m. of the 23d. Just previous to going on watch in No. 1 fireroom at 4 o'clock his bowels moved freely and he emptied his bladder. The ship was making 16 knots through a heavy head sea, and this speed required much harder work than usual on the part of the fireroom force. The temperature below during the entire watch ranged from 112° to 120° F., except for an hour between 5 and 6 o'clock, when forced draft reduced it to 102° F., but increased the air pressure from about one-half an inch to nearly 2 inches of water.

About 5 o'clock he was seized with severe cramps in his arms and legs, and had to stop work for a time. He had been perspiring freely, but when the first pains had partially subsided he noticed that his skin was very dry. Sweating was not reestablished until late that evening. Although the spasms continued, he stuck to his work until he was relieved at 8 o'clock in the morning. He then took a bath and reported at sick call, still suffering with cramps of all the flexor muscles, tonic in character, and lasting perhaps a minute before relaxation occurred. He was at once put to bed, but the spasms recurred every time he attempted to move his body, although they grew progressively less severe. His skin was very pale and dry, his pupils were normal and reacted to light, he complained of a very severe frontal headache, his tongue was dry, pale, tremulous, and lightly covered with a white fur, his breath had a strong odor of acetone, his pulse was 140 and very weak, and his temperature was normal. He was given a quarter grain of morphine sulphate subcutaneously, which probably had much to do with the lessening violence of the spasms. He passed no urine until 6 o'clock in the evening, when he voided 200 cubic centimeters. It was dark in color, perfectly clear, acid in reaction, of a specific gravity of 1.032, and contained a large amount of albumen, but no sugar. There was no precipitate for microscopical examination. Owing to the excessive motion of the ship, it was out of the question to make a blood examination on that day. He drank much water during the day and night, and voided urine freely, which was entirely normal on all subsequent examinations. Only the one dose of morphine was needed, and by morning of the 24th the pain and cramps had disappeared except in the right leg. This passed off during the day, and by the morning of the 25th the patient was apparently well, except for a certain amount of headache and muscular soreness.

About 30 hours after admission (34 hours after the first cramp) the following results were obtained from an examination of the blood, although the extreme rolling of the ship made the work rather unsatisfactory:

The blood flowed freely, and was several shades darker than 100 per cent, Talquist hemoglobin scale.

Hemoglobin..per cent..	100	Differential count:	
Red cells	6,080,000	Polynuclears	0.626
White cells	4,800	Lymphocytes	.213
		Mononuclears	.15
		Eosinophiles	.001
		Mast cells	.01

Case 2.—P. H.; fireman; second class; white; aged 21 years; native of Pennsylvania; short, stocky, and muscular, with fair skin, light brown hair and eyes, and having the appearance of a particularly

robust individual. He uses alcohol in moderation, and tobacco probably to excess both for smoking and chewing. There is no history of tuberculosis or syphilis. He is never seasick, and his general health has always been good. In port his bowels and kidneys act normally, but at sea, under the influence of hard work on his fires, he perspires excessively, and his bowels do not move for days at a time unless he takes castor oil, no other cathartic acting at all well.

He went on watch in No. 3 fireroom at 4 o'clock in the morning of January 23 and came off at 8. He had some slight pain in both legs during this tour of duty, but paid no attention to it. During the remainder of the morning he felt well, ate a hearty dinner, voided urine freely, and drank a large quantity of water. About 3 o'clock in the afternoon general cramps of all his flexor muscles began, gradually increasing in severity for about two hours, when they rapidly subsided. During this period (8 a. m. to 5 p. m.) he did not sweat much, but thinks it was probably because he was in the open air on deck. At 8 in the evening he went on watch again feeling well, although his muscles were sore from the cramps of the afternoon. From 8 p. m. until midnight he had frequent muscular spasms and had to be relieved from duty. The flexor muscles of both arms and legs "drew up in knots," his wrists and fingers partaking of the general contractions. He says these were not as severe as the cramps he had during the afternoon. All during the night he perspired freely, and at sick call on the 24th the perspiration was profuse. At that time his face was flushed, his temperature was normal, pulse 100, full and strong, and his pupils were normal. Examination of his urine showed nothing wrong, and it had not been diminished in quantity at any time. A blood examination was made at 11 a. m. (January 24), 30 hours after his first painful sensations of the previous day with the following result:

As in the preceding case, the flow of blood was free and the color was much darker than the deepest Talquist shade.

Hemoglobin..per cent..	100	Differential count:	
Red cells	5,800,000	Polynuclears	0.46
White cells	5,800	Lymphocytes	.39
		Mononuclears	.12
		Eosinophiles	.02
		Mast cells	.01

The lymphocytes were of the normal size, and the distinction between them and the mononuclears was well marked. The latter variety of cells showed more than the average number of transitional forms.

The conditions in the fireroom prevailing during the attacks of this second case were practically identical with those in the preceding case, the temperature ranging from 108° to 120°, although there was more forced draft with about the same air pressure.

In making comparisons of these two cases it will be seen that, aside from the cramping of all the flexor muscles, the like conditions under which both occurred, the temperature of the patient and the appearance of his pupils, there are practically no points of similarity. Both men are of German parentage, and are rather stolid in temperament. Case 1 is slow of thought, is very quiet, speaks scarcely above a whisper, and apparently takes no interest in anything when off duty; while Case 2 is quite the reverse—full of fun, witty, has many friends, and is always in the thick of anything that is going on. Neither of these men has ever had a previous attack of this sort, though both have been serving in the engineer's division for about two years.

A parallel summary of the results of examination in these two cases shows the chief points of difference:

	Case No. 1.	Case No. 2.
Skin	Pale	Flushed.
Pulse	140, weak	100, strong.
Temperature	Normal	Normal.
Pupils	do	Do.
Bowels	Open	Constipated.
Urine	Suppressed	Free.
Albumen	Much	None.
Perspiration	None	Profuse.
Headache	Severe	None.
Muscular cramps	do	Severe.
Appearance of symptoms	Prompt	Delayed.
Blood	Dark color	Dark color.
Hemoglobin per cent	100	100.
Red cells	6,080,000	5,800,000.
White cells	4,800	5,800.
Polynuclears	0.626	0.46.
Lymphocytes	0.213	0.39.
Mononuclears	0.15	0.12.
Eosinophiles	0.001	0.02.
Mast cells	0.01	0.01.

It is noted that though Case 1 looked very pale and anæmic, his blood count showed an increase of over a million red cells, and the fresh blood was very dark in color.

Although the violence of the attack seemed as great in one man as in the other, yet Case 2 recovered as rapidly as did Case 1, and he was neither put to bed nor given morphine.

At the time of making the blood examination in both of these cases, the worst of the pain and spasm had subsided, yet the very dark color of the blood seems to imply an increased production of carbon dioxide in the system, possibly concomitant with the excessive tissue waste due to heavy labor in front of an open furnace door.

Severe muscular cramps are not common among the engineer's force of this ship. Many men have slight cramps at times, but they attribute their appearance more to the severity of their work than to anything else. It is usually the case that when a fireman feels his work to be more than ordinarily arduous, forced draft steam-

ing is in progress, either for the purpose of catching up on the steam or that new men may become accustomed to the conditions of increased air pressure. But on ordinary runs forced draft is used for short periods only, perhaps an hour during every steaming watch, and it seems doubtful that this is an important factor in the production of muscular exhaustion.

FATIGUE AND EXHAUSTION IN THE FIREROOM.

By Passed Asst. Surg. F. G. ABEKEN, United States Navy.

The passage of the U. S. S. *West Virginia* from San Francisco to Honolulu, between September 5 and 10, 1909, was made in record time at 18 knots, which necessitated steaming with assisted draft. On this occasion a number of muscular prostrations was brought about by excessive quickly repeated muscular efforts of the crew, which was zealous in regaining the ship's position in the fleet formation after nine hours' delay in replacing a broken piston ring in the port high-pressure cylinder. In some instances fatigue was followed by exhaustion. The 20 cases placed on the binnacle list comprised 4 firemen, 7 coal passers, 1 oiler, and 8 of the deck force; about 40 others were similarly affected, but to a lesser degree.

The symptoms varied but slightly and were chiefly those of collapse, dizziness, and painful spasms or cramps in the lower extremities, back, and especially in the abdomen. In two cases the local fatigue in the lower extremities manifested itself so completely that there was a loss of power of both legs, which regained their function only after a day of rest. In fact all cases recovered gradually and resumed their duties after a rest of two or three days.

The patients were given a warm bath, chloroform liniment massage, and then put to bed; those who were suffering with painful and distressing cramps were given morphine hypodermically and a hot-water bag was applied locally.

It is impossible to attribute any one particular cause for this outbreak, as a combination of causes operated. On the very day of our departure from San Francisco for the "speed cruise" one-third of the engineer force was filled by a draft of new men recently recruited and a part of its complement was furnished from the deck force, neither of which groups had been preliminarily prepared for such sudden arduous work by their previous training. It is also interesting to note that without an exception, no matter how trivial the fatigue case may have been, every one had been constipated for two or three days.

From this it might be conjectured that the prostrations from fatigue and exhaustion were due chiefly to previously insufficient exercise of their functions and to the retention in the tissues of metabolic products of their activity; this was doubtless favored by derangement of the excretory channels, which were influenced to a greater or lesser extent

by the exposure to high, though not excessive, temperature and to the somewhat high relative humidity in the fire rooms under the assisted draft.

A CASE OF DIABETES MELLITUS.

By Surg. J. B. DENNIS and Asst. Surg. A. C. STANLEY, United States Navy.

O. S., yeoman, third class, serving aboard the U. S. S. *Virginia*, reported at sick bay complaining of marked pain in lumbar region and frequent micturition. Previous history negative; he appeared to be a well-nourished man of 25 years of age. One month before reporting at sick bay symptoms first appeared; arose several times during the night to urinate; commenced to loose weight and complained of headaches and marked thirst. Examination: Cardiac, pulmonary, and gastrointestinal systems normal; nervous system normal; skin rather dry, with itching about the thighs. The presence of the following symptoms warranted the diagnosis of diabetes mellitus: Progressive loss of weight from 180 to 150 pounds; polydipsia; polyuria (3,500 cubic centimeters in 24 hours); presence of large amount of sugar in the urine; polyphagia. This case is of interest because of the small number of cases appearing in the third decade. Diet was limited to eggs, green vegetables, roast meats, and fish. The medicinal treatment was most unsatisfactory in spite of the use of potassium iodide, codeine, and Fowler's solution, and the patient was transferred to the United States Naval Hospital, Norfolk, Va., for further treatment.

SCIATICA INCIDENT TO PHYSICAL TEST (50-MILE WALK).

By Asst. Surg. J. A. B. SINCLAIR, United States Navy.

G. A. C., captain, United States Marine Corps, age $42\frac{8}{12}$ years, admitted as with sciatica, in line of duty, resulting directly from the heavy muscular exercise and chilling incident to his physical test of a 50-mile walk, about half of which distance was over a rough, uneven, and partly frozen trail.

Pain and stiffness of left lower extremity had become progressively worse from their first indication, on the morning of the third day of his test, when upon arising from a short rest he found the extremity to be quite stiff and for a few moments was unable to move the member.

After a minute or two he was able to bear his weight upon the leg, then to move slowly forward. He had now some $12\frac{1}{2}$ miles remaining upon the debit side of his test. The stiffness and pain wore off as he walked along, but he dared not stop for another rest ere his journey was complete.

From now on but little pain was felt until after the test had been ended and he had been examined by the medical officer. Shortly after examination the pain and stiffness returned and became severe, confining the officer to bed. Severe pain was present throughout the course of the left sciatic nerve, especially acute at the notch and popliteal space. Salol, grains 5 every two hours, and counterirritation by sinapism over entire course of nerve was the treatment employed on the first day. On second day the extremity was splinted. Some pain persisted. On sixth day splint was removed and extremity found to be very stiff and painful when movement was attempted. Splint was not reapplied, but strict rest in bed was enjoined. On eighth day patient was quite comfortable and the extremity was swollen to one-third larger than normal size. With this œdema came almost complete relief from the sciatic pain. The salol had been discontinued on the fourth day. The extremity was massaged with no discomfort on the night of the eighth day. On ninth day there was little or no pain and swelling was slightly reduced. He was allowed up for a short time, no pain on walking, though stiffness due to œdema was present, massage at night. On tenth day patient was up all day, no pain, allowed to go to barracks for one-half hour, massage at night. Swelling from now on rapidly subsided, aided by nightly massage, and on sixteenth day patient was discharged cured.

POISONING RESULTING FROM THE INJECTION OF BISMUTH PASTE.

By Asst. Surg. C. B. Camerer, United States Navy.

J. W. Z., hospital steward. Admitted June 7, 1910, with tuberculosis pneumonica, with a psoas abscess (right side) as a secondary involvement. A well-marked tumor was found to be present below Poupart's ligament and just above the posterior iliac spine, fluctuation being easily elicited over both areas.

July 19, 1910, under chloroform anesthesia, a small canula was inserted into the swelling below Poupart's ligament, the abscess was drained and thoroughly irrigated with boric-acid solution, followed by an injection of 14 cubic centimeters of a 10-per-cent iodoform emulsion through the canula, which was then withdrawn, the wound being sealed with collodion and a firm bandage applied.

July 23 the patient complained of palpitation of the heart, dyspnœa, a feeling of lassitude and vertigo, accompanied by an erythematous rash localized to both deltoid regions. All symptoms subsided at the end of two days.

September 13 the abscess was again opened as before, drained, and irrigated, 120 cubic centimeters of sero-purulent fluid being

withdrawn, microscopical examination of which failed to reveal the presence of the tubercle bacillus. Twenty cubic centimeters of 33½-per-cent bismuth paste were then injected, the wound being closed and sealed.

September 17 patient complained of failing appetite, soreness and swelling of the gums, tongue, and lips (the mucous membranes appearing of a purplish color), constipation, and a feeling of languor accompanied by occipital headache. The next day all symptoms were intensified and the patient was unable to take any but liquid nourishment; temperature 100.4, pulse 99, respiration 22. A bluish-gray line was present around the margins of the tongue and gums, both the lips and tongue being considerably swollen, accompanied by ptyalism and a very foul odor of the breath. Two days later the stools were noticed to be very dark in color; symptoms relative to the buccal cavity being aggravated, necrotic areas being found confined to the hard palate and margins of the tongue, these areas being of grayish color and surrounded by a rather sharply defined bluish-gray border. The temperature reached its maximum at this time (101.2), pulse 106, respiration 24. Patient had lost about 10 pounds in weight up to this time.

The abscess cavity was again opened and drained, about 1,200 cubic centimeters of fluid pus, intermixed with petrolatum and bismuth, being removed. The abscess cavity was then carefully irrigated with boric-acid solution, followed by an antiseptic dressing retained by a firm spica bandage.

Subsequent to this last treatment all symptoms rapidly subsided, the temperature falling to normal the next morning and has remained so ever since.

October 12 a bluish-purple band, varying from 2 to 4 millimeters in width, is still present at the margins of the gums and tongue, all sloughs have cleared away, the mouth, however, remaining somewhat tender and the lips and tongue are slightly swollen. Patient is gaining weight and feels well.

This case is considered to be of interest in view of the fact that it is the only one that has occurred at this hospital, where the injection of bismuth paste is used as a routine procedure in all similar cases.

CURRENT COMMENT.

[It is to be remembered that in the publication of these comments the bureau does not necessarily undertake to indorse the opinions expressed, but will lend the pages of this section to discussion of such contemporary topics as will be of interest and value to the service.]

THE MEDICAL LIBRARY ON THE U. S. S. "SOLACE."

A large general reference library of modern medical works and current medical journals has been placed aboard the U. S. S. *Solace* for the use of the medical officers of the Atlantic Fleet.

It is not contemplated to decrease the number of medical books and periodicals now allowed to ships in commission, but this library is intended to meet a want long felt by medical officers who are frequently in ports where there is no medical library or where such library is inaccessible if actually existent.

Manifestly, it is not practicable to place such a library aboard each ship, for even though funds were available to defray the enormous expense which would be incurred in the purchase, the space allotted to the medical department on board ship is entirely too small to permit a library of such magnitude to be carried. Access to such a medical library as the *Solace* will carry, and to the clinical advantages afforded by the *Solace* will do much toward enabling the naval medical officers to maintain the high standard of professional excellence which is required of them at all times.

The placing of the library aboard the *Solace* is but another step toward giving to the personnel of the service the benefit of the latest advances in medicine and surgery.

DIOXYDIAMIDOARSENOBENZOL IN THE TREATMENT OF SYPHILIS,

It is now but a short time since Ehrlich announced to the world his discovery of dioxydiamidoarsenobenzol and its alleged almost magical effects upon the class of morbid processes known as the spirilloses.

Prominent among these stands syphilis—the everlasting curse of mankind.

Ehrlich announces that with one, or at most three intramuscular or intravenous injections of his new remedy he can cure syphilis.

To those of us who have seen instances of the prolonged and often discouraging treatment with mercury, iodides, and other less efficacious remedies, this announcement seems too good to be true; yet the testimony of Neisser, Wechselmann, and many other competent observers tells us that after administration of this new arsenic compound—

(1) The symptoms of syphilis disappear more rapidly than by any of the methods of treatment hitherto employed;

(2) the treponema disappears from the tissues of the patient; and

(3) the Wassermann reaction gradually grows weaker, until at the end of several weeks it is no longer present.

It seems not amiss at this time to invite attention of intending prescribers of this drug to its not wholly innocuous properties.

Ehrlich urges greatest caution in the selection of cases to whom the remedy is to be administered and strongly advises the employment of other methods of antisyphilitic treatment in all cases of syphilis complicated with organic cerebral, cardiac, hepatic, vascular, or renal disease.

As reports come in from the increasing use of "606" there appears to be an accumulating mass of evidence toward contraindication of the drug in cases of syphilis complicated with retinitis or neuroretinitis, and this evidence is suggestive also of the possibility of the production of an atrophy of the optic nerve as has been observed in the indiscriminate administration of atoxyl (another arsenic compound) in the treatment of syphilis.

On pages 4 and 122 of this issue of the Bulletin will be found detailed instructions for the administration of this medicament.

Also those who purpose to use "salvarsan" (trade name), "606," or dioxydiamidoarsenobenzol, as the drug is variously named, can not do better than to read carefully the articles describing its preparation, administration, effects, and contraindications, which appeared in the Journal of the American Medical Association under the dates of October 1, October 22, December 3, and December 10, 1910.

The recent literature upon the subject has been so extensive that many most valuable articles and reviews have appeared. However, the above references are commended to those unfamiliar with the many facts concerning "606," as a careful perusal of these articles will prove illuminating, and will also prevent the occurrence of embarrassing and perhaps disastrous mistakes. These instructions have appeared frequently in the current medical journals but the references are given in detail again in order that members of the Naval Medical Corps intending to use the drug may have at hand a description of the technique for the preparation and administration of "606."

"The harm likely to be done by the indiscriminate use of "606" in the hands of those who will not exercise proper discretion should

receive no contribution from the medical department of the Navy, and to this end it is expected that not only will the accepted precautions be observed but also that no patient will receive the remedy until the diagnosis is definitely established, either by the demonstration of treponema, the Wasserman reaction, or secondary lesions."

The bureau has endeavored to procure a quantity of this new therapeutic agent in order that those in the service who require it may have the benefit of its administration, but "606" will not be obtainable until after January 1, 1911.

Careful observations should be accurately and concisely entered on the clinical card of each case for purposes of analysis in the Bureau, to which these cards are forwarded each month.

As wonderful as the new remedy appears to be, we must not lose sight of the fact that sufficient time has not elapsed to enable the profession to say whether a cure has been effected; whether a relapse may occur in the oncoming years; or whether aneurysms and the scleroses of vessels, organs, and nervous system are prevented. An interesting field for speculation presents itself.

Have we now a true specific for syphilis?

Are we witnessing the beginning of the end of the sequelæ of this dread disease? Is general paresis passing? Are the many pathetic evidences of innocent suffering so often seen by our profession to be relegated to history? The objective symptoms of syphilis disappear. Is the patient cured? Time must answer.

NEW BLANK FORMS AND INSTRUCTIONS PERTAINING THERETO.

Pending the revision and reissue of the Regulations for the Government of the Navy and the Instructions for Medical Officers during the coming year, the Bureau has by circular letter No. 121206, of September 25, 1910, and by "Addendum No. 4," indicated the general procedures by which the records shall be made effective and complete, and shall be promptly forwarded. It is recognized that certain exigencies either unforeseen or of too little importance to be included in the above orders may arise from time to time; it is, however, assumed that the general purport of the new forms will be appreciated and met; for example, in the event of an officer's detachment and orders home, on leave, or to await orders at some place where no naval medical officer is on duty, the medical officer may, in forwarding the health record through the commanding officer, pertinently suggest that the record be turned over to the officer in a sealed envelope addressed to the "Medical Officer at Station," at which place the officer's accounts may next be enrolled. Until full detailed regulations are issued, when serious doubt as to the disposition arises, the

health record may well be forwarded through official channels to the Bureau of Medicine and Surgery with detailed explanatory letter.

A simple manila card has been issued for the keeping of "Rough Form F," which, if filled out so far as name and rate are concerned at the moment the patient is placed on the sick list, should preclude the possibility of missing a name at the end of the quarter when the smooth "Form F" is executed, and the health record, by reason of transfer of the man, may no longer be available.

On some of these cards the word "Description" appears instead of "Disposition" through a typographical error. This should be corrected where necessary.

It will be noted that the new card "Form X," is to be forwarded weekly to the Bureau of Medicine and Surgery, in the case of first or original enlistments, but immediately in the case of reenlistments, thus enabling the bureau to forward the abstract of the health record in the case of previous enlistment. In the case where, presumably, the enlisted man is to remain at the station where enlisted the entry under "Destination" should be made accordingly.

The new issue of "Form K." presents some changes necessitated by changes elsewhere, as the substitution of the health record for the medical journal and the omission of "Form F,." The contemplated abrogation of this form as foreshadowed in the October Bulletin probably will not occur for some time. In the instructions on both "Form F," and "Form K" several changes will be noted:

1. The day of discharge and not the day of admission, counts as a sick day. This conforms to the usage of the Bureau of Supplies and Accounts.

2. The abbreviations for marginal use to indicate the disposition of patients discharged from the sick list have been increased by the addition of: "C," "H. T.," and "T."

The letter "C" is used to designate the discharge of a patient for a change of diagnosis. This is required for—

(*a*) Cases where, owing to limited opportunities or other causes, an evidently faulty diagnosis has been made;

(*b*) Or where change is required by reason of the intercurrence of another distinct disease, provided recovery and final restoration to duty is regarded as doubtful. As an example of the latter use may be cited the development of typhoid fever in a patient on the sick list with tuberculosis pneumonica; in this case a discharge to duty ("D") is manifestly improper, but patient should be discharged for change of diagnosis ("C"), admitted as ("A") and if recovery ensues, discharged to duty as ("D") as regards the typhoid fever, but readmitted ("R. A.") with tuberculosis pneumonica. On the contrary, the same disease appearing in a case of simple fracture, where the patient is practically well and restoration to duty is anticipated, the

case is properly discharged to nominal duty ("D"), (as he is not likely to be readmitted with the fracture) for admittance with the intercurrent disease.

The letters "H. T." indicate the transfer to a naval hospital for tuberculosis. At present the patients transferred to the United States Naval Hospital, Las Animas, Colo., are the only ones who should be thus designated.

The letter "T" designating transfer is primarily intended to include transfer for further disposition, or transfer from hospital to hospital (except to the Naval Hospital for Tuberculosis at Las Animas, for which provision has been made, and to a hospital for the insane for similar reasons). This designation also includes those cases discharged by reason of expiration of enlistment while on the sick list, and for officers discharged to appear before the retiring board, thus avoiding the misleading designation of duty ("D").

Several changes are made in the nomenclature of diseases. "Hysteria," despite the etymological derivation of the word, has been added. "Insania manic-deprimens" replaces and includes "Mania" and "Melancholia," according to the accepted opinion of alienists of to-day.

While it is recognized that clinically and etiologically dementia may be divided into various forms as praecox, epileptica, alcoholica, syphilitica, paralytica, etc., yet it is regarded as preferable to have these distinctions indicated by inclosing the subtitles in parentheses, as "Dementia (praecox)."

The term "Icterus" has been dropped as being a symptom of diseases included elsewhere in the nomenclature.

The distinction between syphilis primitiva and syphilis consecutiva has been abolished, both being covered by the term "Syphilis."

The term "Paralysis insanorum generalis" has been dropped.

"Psychasthenia" has been added to cover those cases of mental infirmity not properly included under neurasthenia or dementia.

A CASE OF YELLOW FEVER REACHES HONOLULU.

The Weekly Public Health Report of the United States Public Health and Marine-Hospital Service announces the arrival at the port of Honolulu, Hawaii, of a case of yellow fever on November 5, 1910. The patient, a steerage passenger, arrived in the steamship *Hongkong Maru* from Empalme, Mexico, via Manzanillo, and is said to have been stricken with the disease nine days out from Manzanillo, therefore the disease was thought to have been contracted from infected mosquitoes aboard the ship. The prompt action of the quarantine authorities has so far as is known kept the disease from spreading.

This news reaches us at a time when those sanitarians who look ahead are conjecturing and predicting what disease movements may result from the throwing open of the Panama Canal to the commerce of the world.

The *Hongkong Maru* is a Japanese merchant steamer in the Japanese-South American service. Honolulu is a port of call on this service and will probably be visited by most of the vessels engaged in oriental trade as well as by the vessels of the various navies which may be in the Pacific Ocean from time to time after completion of the Canal.

It is probable that the *Hongkong Maru* made the voyage from Manzanillo to Honolulu in about 10 days. (Assuming that her speed is about 15 knots, a steamer should traverse the distance in from seven to eight days.)

Despite the fact that the usually accepted period of incubation of yellow fever will have been passed in a voyage of this duration, a case of yellow fever has reached Honolulu from a Mexican port. This is significant.

It is stated to be the first case of the disease known to have been recognized in Hawaii, if the disease has ever existed there previously. Although epidemics of yellow fever have prevailed in Europe in the past, and the disease has manifested itself from Quebec to Buenos Aires in the Western Hemisphere, yet so far as we are aware, there is no history of an invasion of the islands of the Pacific or of Asia.

The conditions for the spread of yellow fever in Hawaii appear to be ideal. The *Stegomyia fasciata* is present in abundance, the climate favors the rapid propagation of mosquitoes, the rank vegetation affords a food supply for them, and obviously infection of these mosquitoes with yellow fever seems to be the sole requisite for the working of dreadful havoc among the non-immune population of this tropical garden spot.

PROGRESS IN MEDICAL SCIENCES.

GENERAL MEDICINE.

Surg. A. W. DUNBAR and Passed Asst. Surg. J. L. NEILSON, United States Navy.

JONES, ERNEST, M. D., M. R. C. P. (London), demonstrator of medicine and of psychiatry, University of Toronto. **A modern conception of the psychoneuroses.** Interstate Medical Journal, August, 1910.

An argument is made for the embodiment of this subject as an integral part of the curriculum at medical schools. Stress is laid upon increased knowledge of etiological conditions as an aid in estimating various pathological factors. The specific causes of mental disorders are becoming better known, as in the case of general paresis, which, formerly attributed to an ill-defined group of causes, is now recognized as due to syphilis. Jones states that owing to the researches of Freud the specific cause of the neuroses has been shown to be sexual disturbances and even goes so far as to maintain that "no neurosis can possibly arise with a normal sexual life." He admits that this statement is radical but deprecates the attitude of those who are opposed to investigating the sexual life of patients. He claims that those taking this position are thereby disqualified from posing as authorities in this respect.

In the past, three neuroses have been generally recognized, i. e., neurasthenia, hypochondria, and hysteria, based upon an arbitrary grouping of symptoms.

A classification based upon the pathogenetic causes and not according to superficial characteristics is needed.

Freud has shown that it is essential to differentiate between the "actual neuroses" and the "psycho-neuroses"; in the former the individual symptoms not being explainable by psychological analysis, while the latter can be demonstrated to be "the last links in a long chain of mental processes." The diagnosis of neurasthenia is loosely made, different conditions being confounded with this disease. The writer is of the opinion that a majority of the cases diagnosed as neurasthenia are obsessions, phobias, compulsion or anxiety neuroses, or hysteria; that many are mild forms of dementia præcox, manic-depressive insanity, incipient general paresis or post-influenzal depression, and that but 1 per cent are true neurasthenia. True neurasthenia, a condition of pure fatigue, with a sense of pressure in

the head, irritable spine, flatulent dyspepsia, and constipation, when the above diseases are eliminated, is due to abnormal sexual conditions.

In "anxiety neurosis" marked anxiousness dominates and in acute cases is so intense that consciousness may be lost; palpitation, dilated pupils, nausea, vomiting, diarrhœa, and polyuria are occasional symptoms. In the chronic forms the patient is in constant apprehension and readily responds to any idea in any way justifying anxiety; there is sleeplessness, general irritability, auditory hyperæsthesia, paræsthesias, and vasomotor congestion. Gastro-intestinal disturbances may simulate organic disease. The cause here is a vicious sexual life, overwork and strain being merely exciting factors.

The above constitute the true neuroses.

The psychoneuroses proper have symptoms which arise from unconscious mental processes which the patient can not spontaneously recall to memory. The mental life is discontinuous; bizarre obsessive thoughts arising unbidden may cause fear or rage. Under psycho-analysis, however, these obsessions are found connected with significant underlying unconscious mental processes.

These unconscious processes are due to defensive mental efforts of the patient concerning certain memories wished forgotten by reason of shame or disgust. The symptoms are due to the distortion of the wish desiring external expression by the "repressent" force, preventing recognition by the patient.

The writer states that the dynamic forces or wishes are sexual in nature, representing a perverse unconscious sexual gratification, accounting for the persistency with which retained.

The forms of psychoneuroses are according to Freud, (1) the classical hysteria or "conversion-hysteria" in which psychical disturbances are converted into physical symptoms; (2) "anxiety-hysteria" where both cause and effect are psychical, constituting "phobias;" and (3) "compulsion-neurosis" manifesting obsessions.—(A. W. D.)

Cocks, Gerald Hutchinson, M. D. **Status thymo-lymphaticus and its relation to sudden death.** The Laryngoscope, July 10, 1910.

The condition of status thymo-lymphaticus occurs in both children and adults and is characterized by a hyperplasia of the thymus gland, lymph nodes, tonsils, lymphatic elements of the spleen, intestines, and marrow of the long bones. Associated with it are cardiac hypoplasia, abnormalities of the thyroid gland, epilepsy, acromegalia, myxœdema, and Addison's disease.

Status lymphaticus and status thymicus are probably essentially different phenomena, the former being characterized by a hypoplasia of the chromaffin system particularly in the adrenals, while in the latter

it is always well developed. For the purpose of this paper the terms are regarded as synonymous.

The author reviews the weights of the thymus gland at various ages and quotes Hammar as believing that rapid involution occurs in acute and chronic disease, and also that the weight of the gland is no criterion for estimating the amount of the parenchyma of the organ.

In 1889 Paltauf called attention to the cases of sudden death occurring in this condition following shock, immersion in cold water, and in chloroform anæsthesia. Two cases were reported and since that time numerous others have been noted. The writer has noted cases where sudden death followed the use of diphtheria antitoxin and also among laborers working under high air pressure in whom enlarged thymus glands were found. Blake and Hart report fatalities under general anæsthesia where the only pathological lesion found was status lymphaticus. An analysis of reported cases shows that chloroform is the most dangerous anæsthetic to use when status lymphaticus exists and should be avoided in adenoid and tonsil operations. Cases of death are reported as following the use of tropocaine and cocaine as local anæsthetics. Ten cases are reported from the Bellevue Hospital Pathological Laboratory in which death is traceable to status lymphaticus alone or associated with cerebrospinal meningitis, pyæmia, or exophthalmic goiter. The pathological lesions other than stated above show a simple hyperplasia of the lymphoid cells of the thymus. Blumer found a proliferation of the endothelial cells along the trabeculæ of the thymus. A similar condition appears in the cervical, axillary, inguinal, mesenteric, and bronchial lymph glands and in the faucial, pharyngeal, and lingual tonsils. Anomalies of the heart and arteries are frequently present.

From a study of the cases reported it is seen that status lymphaticus is a frequent cause of death during anæsthesia, in trivial shock and infectious disease. Three theories are advanced to account for this, viz., (1) mechanical compression; (2) Paltauf's theory, and (3) hyperthymization. Enlargement of the thymus gland may produce suffocation, and good results have followed thymectomy. Paltauf believes that the hyperplasia is due to an intoxication due to faulty metabolism. The cardiac centers become affected and may suddenly cease functionating. The theory of hyperthymization considers that the increase of this internal secretion renders the organism more susceptible to external influences. Thymectomized animals show an unusual resistance to chloroform. Wiesel holds that it reduces arterial and cardiac tonicity.

Unfortunately, status lymphaticus has not been diagnosed prior to autopsy in those cases dying during anæsthesia. The history of sudden unexplained deaths in the patient's family should arouse

suspicion. The symptoms of the disease are a pasty skin, evidences of rickets, rotundity of the limbs, absent or scanty axillary and pubic hairs, brittleness of the hair, infantilism, enlarged lymphatic glands, and hypertrophied tonsils. The spleen may be enlarged. McCardie states that signs of low arterial pressure may be present. Lymphocytosis and diminished hæmoglobin are of some significance. Where the enlargement of the thymus is great a pulsating tumor may be felt above the sternum. An area of dullness extending over 1 centimeter beyond the borders of the upper sternum is evidence of an enlargement of the gland. Radiography is the most certain and only reliable method of diagnosis.

Cocks summarizes as follows:

1. The thymus gland is probably an epithelial organ with an internal secretion.
2. The diagnosis of status lymphaticus as a cause of death is made too frequently. Hammar's statistics show that the thymus gland is normally much larger than is generally supposed.
3. Mechanical tracheo-stenosis undoubtedly exists as a cause of death in rare instances.
4. The usual cause of death in status lymphaticus is probably a "hyperthymization" of the organism, which renders it peculiarly susceptible to harmful external influences, such as shock, anæsthetics, and infectious disease.
5. The diagnosis of status lymphaticus can undoubtedly be made intra vitam. The X ray offers the most certain and reliable means of determining the presence or absence of an enlarged thymus gland.
6. If status lymphaticus exists, chloroform is the most dangerous anæsthetic.—(A. W. D.)

WHIPPLE, G. H., M. D., CHAFFEE, B. S., and FISHER, R. F. **The Cammidge test in experimental pancreatitis and other conditions.** Bulletin of the Johns Hopkins Medical School, Vol. XXI, No. 236.

After a discussion of some of the latest work done by various observers in connection with the Cammidge reaction, the authors state that—

A review of these reports would indicate that the different workers were examining different substances or perhaps a compound of many substances in which the constituents varied under different conditions. Grimbert and Bernier are of the opinion that the test is valueless because of its presence in normal urine. They believe that the form and type of the crystals are dependent upon the concentration of the solutions and the salt content. Our experience confirms this in part, and we believe that the ease with which the acid dissolves the crystals depends in great measure upon the delicacy of the crystals.

In a recent communication Cammidge has reported some observations on animals which are in harmony with his observations on human cases. It is very easy to criticise this series of experiments, and requires but little space, as he reports observations on a few animals in a rather incomplete manner. The pancreatitis was produced in a foreign laboratory by injection of turpentine into the gland or by passing a ligature into the pancreatic duct. No careful protocols of the experiments are given. The urine was sent a considerable distance in bottles preserved with toluol.

Cammidge found the tests to be uniformly positive and to resemble in every way those made in human cases. The crystals were similar and the melting point identical (178–80° C.).

The method employed by the authors in making the interesting experiments given in detail in this article is that described by Cammidge as "Test C."

Two human cases are reported by these observers. The first case gave a positive reaction in the Cammidge test and autopsy showed abscesses in pancreas, acute pancreatitis with fat necrosis, etc. The second was a case of leukæmia, which gave a positive reaction. Autopsy showed the pancreas to be of normal size, appearance, and histological structure.

Incidentally it is mentioned that—

One of the workers in this group who has tested his own urine repeatedly has found on many occasions a typical positive Cammidge test, yet he is a strong adult male with excellent past history and not the slightest evidence of any pancreatic disease.

Excerpts from the general discussion are given below, as follows:

Work in this laboratory has convinced us that there are several sources of error in the method—test "C"—and that the personal interpretations of a given test may be various. We have endeavored to eliminate this personal factor by duplicate tests and by repeated examinations of crystals from a single specimen by various workers on the same or different days. Even when quite inconspicuous, the sediment in any given tube should be examined under the microscope, for it may be very slight and yet contain typical crystals. The crystals vary in the most amazing degree in some experiments, and it is not unusual to find at least two distinct types of crystals, perhaps both insoluble or both readily soluble in acid or one readily soluble and the other resistant to the acid. In such cases it is easy to understand how one person could diagnose the test as positive and a less enthusiastic observer as negative. Parallel tests on the same specimen of urine by different workers usually gave identical results, but sometimes there were some minor differences in the shape and solubility of the crystals. It was found that the crystals could be modified to a considerable degree by slight changes in concentration of the solution or rapidity of cooling. When it was further noted that the solubility of these same crystals could vary to a certain degree depending on their shape and size, it seemed certain that this might be a grave source of error. The solubility depends in part upon the delicacy of the crystals, the long slender blade forms being almost invariably soluble on contact with acid. Changing the salt content may modify the type of the crystals and certainly the amount. This may be of importance when a concentrated urine is being tested.

It seems pretty clear from various publications that different observers are dealing with different substances or combinations of substances. The melting point of the Cammidge crystals is given as all the way from 140° to 180°. It is difficult to obtain a mass of these crystals in pure form, free from salts, etc., but this factor alone can not explain the great variations seen in the publications of various workers.

Similarly one is not surprised by the reports of quite positive Cammidge tests in cases of pneumonia and peritonitis where there is much cell destruction and solution, particularly in the late stages. Only a single case of pneumonia in a dog has come under our observation, and that animal gave a typical Cammidge reaction.

CONCLUSIONS.

1. The Cammidge test is of little value in establishing a diagnosis of acute pancreatitis in dogs. If the test is negative, it is pretty strong evidence against an acute pancreatitis.

2. The Cammidge test is of even less value in the condition of chronic pancreatitis in dogs and may be consistently absent even in extreme grades of this disease.

3. A positive Cammidge test is not infrequent in normal dogs and men.

4. The Cammidge test is almost constantly present in chloroform poisoning in dogs—a condition in which there is extensive liver necrosis and cell autolysis.

5. The Cammidge test may be present in cases of pneumonia or in any condition where there is active cell destruction and autolysis.

6. The Cammidge test may be produced experimentally almost at will by intraperitoneal injections of hydrolytic cleavage products. These split products may be prepared by boiling pneumonic lung tissue (dog or man) or thymus for hours with dilute acid, neutralizing, filtering, and concentrating to a clear fluid.

7. The melting point of the crystals varies under different conditions, indicating that the substance or substances are not identical.

8. The method is open to various errors and too much depends upon the personal equation, particularly in the interpretation of the various crystals.

9. The method is time consuming, and the results do not seem to warrant the expenditure of the time and materials.—SURG. J. C. PRYOR.

DAVIES, F. T. H., M. B., Ch. B. **Hiccough in the course of diaphragmatic pleurisy treated by Laborde's method.** British Medical Journal, October 17, 1910.

After pneumonia and pleurisy the patient developed distressing hiccough, occurring with every inspiration. All the usual methods for relieving the condition were used without avail until Laborde's method was employed. The tongue was seized by the tip and pulled well forward and held in that position for two minutes. The hiccough ceased immediately.—(J. L. N.)

NICOLETOPONLOS. **Fatigue the cause of enuresis,** Arch. Med. des Enfants. September 10, 1910.

The author in three cases demonstrated conclusively that fatigue will increase nocturnal incontinence and proved the efficacy of rest, attributing the bad effect of fatigue to the deep sleep resulting. It is suggested that involuntary micturition is due to hyperacidity of the urine and Lagrange has demonstrated the increase of acid in the urine of fatigued persons. Marcus has shown that in soldiers who had undergone exercise the urine exhibited a quantity of lactic acid which had not been present before. Alkalinity is not always associated with incontinence and adenoids. Phimosis, etc., may exist in a child who is completely cured of enuresis by being given rest. This is of interest in the light of the number of cases found amongst apprentice seamen in whom the condition is greatly aggravated after enlistment.—(J. L. N.)

ZELLER, C. A., M. D., Peoria, Ill. **Pellagra. Some clinical and other features of the disease.** Interstate Medical Journal, Vol. XVII, No. 9, September, 1910.

The writer of this article first emphasizes its importance by calling attention to the fact that the conservative British Government has appointed a commission for the study of pellagra and that they have ascertained rather startling facts, namely:

Pellagra is one of the most formidable disease scourges of mankind.

Whenever its occurrence has been noted for any length of time it has shown a marked tendency to show extension.

For Italy a yearly estimate of 60,000 standing cases is no exaggeration, whilst Roumania, with a population of 5,300,000, is estimated to have 40,000 to 50,000 cases.

In the United States of America a few sporadic cases have been reported from time to time, but since 1906 the disease seems to have rapidly increased and numerous cases have already been reported from no less than 22 States.

He goes on to say that the disease is here amongst us as well as its causative factor, and as long as this is so and the causative factor remains unknown we are powerless to prevent its spread, and a repetition in this country of what has taken place in Italy and Roumania is not an impossibility.

He leaves the problem of etiology to the hundreds of scientific men who are working on this subject, but sounds a note of warning by quoting the apt remark of Capt. Siler, of the United States Army Medical Corps, made after a personal inspection of the *pellagrasori* of Italy. "The Italians have lost sight of pellagra in their researches and have been studying corn." He cites, however, his experiment on 56 non-pellagrous patients whom he kept for nine months in isolation, feeding them liberally on every corn product. His results were absolutely negative as regards pellagra.

While the study of the etiological factors is going on he advises careful study of cases and treatment at no matter how great expense, even as we have done with insanity, the cause of which is as much a mystery to-day as it was a thousand years ago.

He emphasizes the cruelty of the disease in its painlessness and the insidiousness and the fact that it attacks high and low, and young and old, though most of the victims are amongst the poorly nourished and those past middle life.

He states that it is a disease of 15 to 20 years' duration, yet a case may terminate fatally in a week, having exhibited all the symptoms in this brief time that are shown by the long continued cases, and that there is absolutely no evidence that it is contagious, and still it is spreading.

After concisely stating the dermal manifestations of the disease, during which he brings out the striking symmetry of the lesions, he speaks of the severity of the gastro-intestinal symptoms, the extreme loss of weight, and the grave mental disorders which frequently manifest themselves.

He says: "A typical case of pellagra running the course will present, aside from its visible changes, almost every mental and nerve symptom exhibited in a typical case of paresis, the terminal stages of the two being strikingly alike."

To quote further: "Pellagra terminates in insanity. Pellagrous insanity has reached the dignity of official recognition in Italy and the Southern States, and patients are regularly committed to the asylums under that classification."

Dr. Zeller is the superintendent of an insane asylum of some 2,100 inmates, and his question should give rise to much thought.

The article is well illustrated by photographs of typical skin lesions of the disease.—(J. L. N.)

BEGGS, WILLIAM N., A. B., M. D. **Is mercury a specific in pulmonary tuberculosis?** Medical Record, August 20, 1910.

Beggs defines a specific as a remedy which uniformly results in the recovery from a given disease, and, as a corollary, must be applicable to all the clinical varieties and to all stages of the disease except the terminal stage.

It must not be restricted in its usefulness to the incipient cases.

It must be adaptable to the different stages and virulence of the disease, and, finally, must be independent of the "personal equation" of the practitioner, provided he possesses ordinary skill.

He reviews medical literature to show that the use of mercury in tuberculosis is not a recent idea, but was tried and found of no value many times during the past century.

Beggs reports 30 cases under his professional care and 14 reported by Collins in which mercury was used in the form of blue mass, the bichloride, protoiodide, and succinimide.

From these he concludes that:

1. Mercury is in no sense a specific in tuberculosis.
2. Mercury is of no value in certain cases of pulmonary tuberculosis.
3. It is not determined what cases will be improved, but probably those in which a luetic taint can not be excluded and those responsive to suggestion.
4. That the improvement is largely suggestive, with little change in the physical signs.
5. Lues excluded, the improvement is probably due to the tonic effect of the mercury or to psychic influence.—(A. W. D.)

LUMSDEN, L. L., Passed Asst. Surg., P. H., and M. H. S. **A case of an acute febrile and probably infectious disease of unknown origin.** Washington Medical Annals, Vol. IX, No. 4, September, 1910.

R. F., male, 9 years, after a period of slight prodromal symptoms (headache, anorexia, and nausea), lasting four days, had an abrupt onset with temperature rising rapidly to between 103° and 104° F.

within two or three days, remaining quite steady at this point for 10 days or more, and then falling by rapid lysis and reaching normal within 72 hours after defervescence had begun, with a convalescence that was rapid and uneventful. A skin eruption appeared between the third and sixth days, and persisted as a single crop until after defervescence. The eruption was maculo-papular in character, 2 to 4 millimeters in diameter; dusky red; did not totally disappear on pressure, but left a brownish or purplish stain when the skin was pronouncedly anemic from pressure. It was located on the upper and lower extremities, being sparse on shoulders and hips and more profuse as the extremities were descended and thickest on the backs of the hands and feet. No rash on palms or soles. The lesions were not sharply defined, but faded into the surrounding skin, and where most profuse some coalescence was found. A rather severe bronchitis existed during the period of fever. Severe headache, marked conjunctival congestion, obstinate constipation, and occasional slight nosebleed were noted. No labial herpes, no retraction of head, no Kernig's sign, no convulsions were present, though slight stiffness of the neck muscles, restlessness and mild delirium were present when the fever was high. Repeated Widal tests were negative, as were also cultures for typhoid and paratyphoid, bacilli from blood and stools. Leucocyte count showed 17,400.

In the American Journal of the Medical Sciences, April, 1910, Dr. Nathan E. Brill, under the title "An Acute Infectious Disease of Unknown Origin," reports 221 cases similar to the above that have occurred in New York City since 1895.—(J. L. N.)

EINHORN, MAX, M. D. **Further remarks on duodenal alimentation.** Interstate Medical Journal, Vol. XVII, No. 9, September, 1910.

By the citation of three cases the author demonstrates the diagnostic importance of the duodenal bucket in gastric ulcer and the efficacy of duodenal alimentation in keeping up the patient's strength and weight, yet giving the stomach a perfect rest.

He describes a simple apparatus that can be manipulated either by one nurse, or even by the patient himself, once the tube is in place. He leaves the duodenal tube in position for from 10 to 14 days at a time, feeding the patient through it 8 to 16 times in 24 hours, 5 ounces at a feeding. The only medication is calcined magnesia and bismuth subnitrate. Milk, raw eggs, and lactose were used as food.—(J. L. N.)

HIGGINS, W. H. **Pemphigoid eruptions in typhoid fever.** Bulletin of the Johns Hopkins Hospital, September, 1910.

In the brief report the writer refers to three cases in which a pemphigoid eruption appeared during the course of typhoid fever. He remarks upon the rarity of the complication, intimates the possibility that it may be a type of pellagra, and closes with the remark that it is an omen of grave significance.—(J. L. N.)

SURGERY.

Surgs. RAYMOND SPEAR and EDGAR THOMPSON, United States Navy.

CUSHING, HARVEY, M. D. **The special field of neurological surgery, five years later.** Bulletin of the Johns Hopkins Hospital, November, 1910.

The paper is a résumé of the surgical advances in neurological fields, and records the birth of a specialty, and its marvelous growth, under the master hands of the investigators and the men who have carefully planned and carried out successfully the different operative procedures.

Under "The Brain and its Envelopes," are discussed brain tumors, headaches, intracranial hemorrhages, hydrocephalus, and dyspituitarism.

Surgeons have long known that mere trepanation has relieved symptoms due to intracranial pressure, but credit is due Cushing for having worked out the operations of deliberate subtemporal and suboccipital decompressions, not only for the immediate relief of intracranial pressure but also as preliminary procedures before the dura is opened when the brain tension is such that in all probability if the operation were proceeded with and the dura opened a hernia of the brain would follow with its untoward results.

In a case of frontal tumor, operated upon by Cushing, a large bone flap was turned down and the anterior half of the left hemisphere was exposed, the dura was so tight that it was deemed advisable to lessen the tension.

A lumbar puncture was performed and the tension was then further lessened by a subtemporal decompression on the left side, the dura was opened over the temporo-sphenoidal lobe and the bone flap was replaced. Five days after the first operation a subtemporal decompression was performed on the right side and five days later the osteoplastic flap was again turned down, the dura was opened, the tumor was easily exposed and successfully removed.

In all there have been 180 cases admitted to the Johns Hopkins Hospital with brain tumor, most of these having been admitted during the past two years, 250 operations were performed on these cases, including preliminary subtemporal decompressions for preservation of vision before the tumors had been located.

The use of the electric ophthalmoscope made a careful study of the eye grounds possible and it was soon observed that intracranial pressure could be determined accurately by the neuro-retinal stasis and œdema, so the choked disk was anticipated.

Routine perimetric observations were made before and after operations in tumor cases. It was found that a characteristic alteration occurred in the boundary relations of the color field. An interlacing or actual inversion of the outlines of the color fields affecting usually the blues was noted constantly. This inversion of the color field was supposed to be a symptom of hysteria. The interlacing disappeared promptly after the relief of pressure. A case of tumor weighing 200 grams presented this symptom, with mild Jacksonian attacks starting in the left foot, without, however, a choked disk. In only two cases out of the hundred examined was any tendency to color inversion absent.

Brain tumors, in Cushing's opinion, are not at all uncommon. Many cases are diagnosed variously from gastric headaches, arteriosclerosis, hysteria, etc., to dementia, hydrocephalus, and toxic amblyopia.

With the Wassermann and Noguchi tests it is now no longer necessary to subject patients to the therapeutic test of mercury and iodide to exclude syphilis in a differential diagnosis.

In cases of persistent and severe headaches subtemporal decompression operations have often relieved patients completely and permanently. In one class of cases with hemicrania and marked arterial dilatation of the temporal vessels with venous congestion, subtemporal decompression operations usually bring relief. Increased tension is noticed in some of these at the site of the bone defect during subsequent headaches.

The treatment of intracranial hemorrhage by decompression measures has been one of the recent advances in the treatment of these cases. The procedure is now a routine one in all basal fractures.

In cases of apoplexy Cushing feels that a great deal of damage is due to compression from extravasation and to secondary œdema rather than to actual destruction of important nerve paths. He is unprepared now, however, to state whether or not operative procedures are justifiable.

Much remains to be learned about hydrocephalus. The development of the ependymal and meningeal spaces and the normal outlets of escape from the arachnoid are as yet poorly understood. We know that the fluid is being constantly formed and that its main outlet is from the subarachnoid space into the dural veins and sinuses, and that it has a close association with the venous system, and it is also a carrier of the secretion elaborated by the posterior lobe of the hypophysis. In most cases of essential hydro-

cephalus the fluid finds its way from the ventricles into the subarachnoid spaces so it can be emptied by a lumbar puncture.

The author states that operative procedures, extirpation, arachnoid drainage, ventricular puncture, and decompressions have benefited about 50 per cent of the cases of general epilepsy operated upon.

In regard to the surgery of the pituitary body the fact that the anterior lobe is essential to life makes only the infundibular lobe, surgically speaking, approachable, so about the only operative procedures embrace removal of the sellar base and incision of the glandular capsule—a local decompression.

Under the heading of "Spinal cord," meningitis, tumor, and trauma are discussed.

Under meningitis, attention is called to a group of epileptic cases in which symptoms of paraplegia had developed. Division of the posterior nerve roots relieves pain; some cases are much benefited by a laminectomy, for at times encysted fluid causing pressure symptoms has been evacuated with happy results.

The cases of spinal tumor operated upon have in many instances been very satisfactory. Relief from pain and crippled condition often followed successful removal of benign endotheliomata. Flattened cords have regenerated to a remarkable degree.

Under trauma the cases are divided into three classes, the hæmatomyelias, total transections and the partial transections. The first two should not be operated upon; the third class should be operated upon as soon as the diagnosis is made to relieve it from pressure and from the effects of a progressive œdema.

The operation advised is a total removal of the spines and laminæ, keeping absolutely in the median line and scraping off the periosteum from the bones removed. Cushing, after removing the spines, enters the canal by means of a perforator and large burr introduced successively at the amputated base of each spine. The lateral fragments of the laminæ are then nibbled away with sharp-nosed rongeurs.

In nerve anastomosis the anastomosis between the seventh cranial and the spinal accessory is preferred to the union of the seventh with the hypoglossal, for in the author's opinion the resulting drooping of the shoulder is less objectionable than the thickness of speech.

Deep injections of alcohol in cases of trifacial neuralgias are advised before operative procedures.

Ninety consecutive cases of trigeminal root avulsion without mortality are reported. Most of the cases operated upon were relieved of their distressing pain. Three classes of neuralgias, however, are not benefited—those in which Meckel's ganglion is the seat of the trouble, those in which the sensory filaments of the seventh are involved, and finally those due to brain tumors.—(R. S.)

WILDEY, A. G., Fleet Surg., R. N. **Hypodermic injections in "action:" Suggestions for simplifying their administration.** British Medical Journal, August 20, 1910.

Wildey reminds us that at the time of a naval battle the first duties of the surgeon and his assistants, professional and lay, will be to check hemorrhage, pain, and shock. The administration of morphine under the skin and perhaps along exposed nerve trunks will not only control pain but tend to diminish shock. Describing the conditions which may be expected to prevail following a severe engagement, he shows that the usual method of giving hypodermic injections will consume too much time for the relief of the many. The suggested remedy is to provide a nonspillable bottle, such as a low, large salt-mouth vessel, holding not less than 1 fluid ounce "and fitted with two or double-layered india-rubber detachable caps" through which the needle of the syringe is thrust for each charge. There is also to be provided "a metal scabbard attached to the coat to readily and securely hold the needle-fixed syringe when not in actual use" and when both hands are required for other purposes. The morphine solution can thus be given, if necessary, in the dark, for the solution is now supplied in the British Navy with and without atropine in such strength that 5 minims (evidently the capacity of the syringe) contain one-sixth grain of sulphate of morphine. It is stated that whatever container or "apparatus is used the morphine solution must not be kept for more than a few hours in any but amber-colored, alkali-free glass vessels, or gradual precipitation of the alkaloid occurs." Surg. Gen. Evatt, in the discussion, suggested that instrument makers might devise a metal morphine-solution container to which the hypodermic needle could be attached, the dose administered, and the instrument thrown away.—SURG. C. N. FISKE.

SCUDDER, CHARLES L., M. D. **The result of one hundred and sixty-eight operations for hernia.** Boston Medical and Surgical Journal, September 1, 1910.

Among the points noted by the writer from his experience are the following:

1. The sac lies anteriorly to the cord and should be identified, opened, and emptied of contents (Trendelenberg position often advantageous) before any steps are taken to free it from the cord or to displace the cord itself.

2. The dissection of sac from cord is best accomplished with a gauze sponge.

3. With a very thin sac the purse-string suture suffices for closing the neck on the plane of the parietal peritoneum. With a thicker sac the continuous loop or hemstitch suture is recommended.

4. If there exists in any case of hernia a good-sized varicocele, it is wise to remove the veins not only for the cure of the varicocele, but to obtain greater security in the wound. Unless there is a definite varicocele resection of the spermatic veins should not be performed.

5. If an undescended testicle be encountered, its removal and the ligation of the cord at the internal ring is indicated.

6. In placing the first row of deep interrupted sutures for the obliteration of the inguinal canal, one or two sutures are always placed external to the cord and superficial to the sutured neck of the sac.

7. A continuous loop or hemstitch suture is used in closing the aponeurosis over the cord, as this form of suture secures not a mere approximation but an overlapping of edges, as does a mattress suture.

8. The superficial fascia and fat are approximated with interrupted sutures. The skin is then closed with silkworm gut.

9. Complete hemostasis and a minimum of trauma to the tissues are to be secured.

10. Apply a ham splint for 24 hours to prevent flexion of the extremity and consequent interruption of the steady pressure secured by the spica or adhesive-strap dressing.

The writer has had no deaths in the uncomplicated group of cases and finds the operation itself to be entirely devoid of danger, except in infancy, old age, or serious ill health. He had 10 deaths in the strangulated group and 2 deaths in congenital cases operated on in the first 24 hours of life. Operation for the radical cure of hernia is not advised under the age of 3 years.

Of those cases in which the end result was known, complete cure was effected in 90.9 per cent of inguinal cases, 93.3 per cent of ventral cases, and in all of five epigastric cases.

We think all surgeons will agree with the writer's insistence upon the need of an anatomical dissection of the parts concerned so that every structure is clearly recognized. When the incision in the aponeurosis has been completed we have always found the rubber-gloved finger the ideal blunt dissector for raising the aponeurosis from subjacent structures and clearing the reflection of Poupart's ligament below.

The writer recommends chromic catgut for all suturing until the skin is reached. It has been a common experience with us in the use of this material that the knots are not absorbed for a very long time but remain as shotlike bodies, causing irritation and collections of serum which sometimes break through the healed wound. We have never had this annoying experience with kangaroo tendon and much prefer it to catgut for all suturing in hernia operations until the skin itself is reached. One kangaroo suture of the length ordinarily supplied is long enough for the continuous suture of the aponeurosis.—SURG. J. F. LEYS.

STARR, F. N. G., M. B. (Toronto). **Modern treatment of fractures.** British Medical Journal, July 9, 1910.

The author quotes the following statement of the surgeon to the metropolitan police of London:

Recovery from the point of view of the surgeon and that of the patient does not always coincide in date. The standard of efficiency is high in the police, the class of men principally under consideration. The work demands fair activity; thus, for two periods of four hours, or for one tour of eight hours, a man must be continually on his legs day after day, though with frequent short spells of leave. Judged by this standard, and desirous of keeping well within the mark, my estimate is that at least 30 per cent fail to attain this standard after simple fracture of both bones of the leg—very few regain it under six months. * * * Fractures of the leg, involving the knee or ankle joints, or fractures of the femur uniformly lead to permanent unfitness for the work which devolved on these men. Fractures occurring in the neighborhood of these joints nearly always have the same result. I can hardly recall a case of Pott's fracture or a Dupuytren's fracture where recovery has been complete enough to enable a man to resume police work. * * * My experience with regard to fractures of the leg has led to the expression of rather gloomy, perhaps pessimistic, views.

Ashurst and Newell are also quoted to show the following end-results of 61 cases of fracture of the femur:

Twenty-eight cases with perfect functional result; 21 cases with no disability but a limp (would not do for police duty); 8 cases with marked impairment of function; 4 cases incapacitated.

With these facts before him and with the information given by the X rays of the rarity of perfect apposition secured and maintained by fast splinting methods, Starr was convinced that the open method of plating fractures is the most scientific treatment.

The open method is especially demanded in fractures where the natural tendency is toward persistent deformity; as in Colles's and Pott's fracture, fracture of the patella, clavicle, olecranon, of both bones of the leg, and in fractures near joints.

The danger from sepsis is the only real objection that has been urged against the open method. The advantages of the method are as follows:

1. The mechanism of the skeleton is left unimpaired and the patient therefore has perfect anatomical and functional results.
2. The period of incapacity is shortened.
3. The pain is relieved in a few hours.
4. There is no risk of muscle fiber being left between the bones to favor nonunion.
5. The surgeon can see what he is doing and can accurately approximate the fragments.
6. There is immediate relief from the tension, etc., resulting from extravasation.—(E. T.)

DaCosta, John Chalmers, M. D. **Report of two cases of revolver shot wound of the brain.** New York Medical Journal, October 29, 1910.

DaCosta recalls some of the well-known cases in which pistol balls have been carried in the brain substance. The older surgeons taught that it was bad surgery to interfere when the missile was doing no harm. There were many cases reported in surgical literature when the bullet was supposed to have lodged in the brain, when in all probability the bullet did not penetrate it but lodged in the skull. By X ray examination we can now positively state the exact location of a bullet.

The author states: "Lead pistol balls are septic, and a bullet in the cortex of the brain will sooner or later, in the greater majority of instances do dreadful harm. In most cases it does harm very soon; in some few cases after a considerable period or a long time. Camden's patient lived for 13 years, then an abscess developed and the man died."

If the patient does not die quickly of shock or hemorrhage the bullet, if allowed to remain will usually induce a septic leptomeningitis, encephalitis, thrombosis or abscess. The bullet may become encysted, and in almost all cases will cause irritation, destruction of brain matter, and will cause death after a prelude of epilepsy, paralysis, amnesia, deafness, blindness, cerebral softening or insanity.

DaCosta, in view of these facts, although admitting that a man may carry a bullet in his brain for a long time, strongly advises prompt removal of the bullet in all cases if it is possible.

Cases of lodged bullets in the brain should be studied carefully and the following points determined: (1) The exact location of the bullet; (2) the course of the bullet from the wound of entrance; (3) symptoms present; (4) symptoms due to the lodged bullet and lesions which have arisen in the track of the ball.

By means of Dr. Manges's modified Mackenzie-Davidson localizer, which is made entirely of metal and can be sterilized and used at the operation, the bullet can be accurately located and if lodged in the brain near a vital center the possibility of its removal without inflicting irreparable damage in the brain can be carefully studied and a plan of approach mapped out.

It is always to be remembered that the brain symptoms may be due not only to the lodged bullet but to also bits of lead, bone, powder, etc., left in the track of the bullet. It is of the greatest importance also to remove these. The removal of the bullet will of course in no way relieve symptoms due to the brain destruction produced by the moving ball.

The first case reported was a self-inflicted wound by a .22 caliber pistol ball on January 13, 1907; was admitted to Jefferson Hospital on September 25, 1907. The bullet was accurately located by Dr.

Manges and without warning the patient passed into a status epilepticus. DaCosta opened the skull and found the bullet in the parietal lobe at the point indicated by Dr. Manges. The bullet was in a cavity whose walls were thick and smooth except at one point. The bullet was free and movable. It was removed and the cavity irrigated by saline solution. The man made a good operative recovery. No convulsions occurred during a number of weeks while under observation, but the loss of memory which had been a prominent symptom was not improved. It was probable that the encysted bullet beneath the cortex caused convulsions and when the bullet got loose and moved about in the cavity it caused enough irritation to induce a status epilepticus.

The second case was that of a man 30 years of age who shot himself in the right temporal region with a .32 caliber pistol on December 22, 1909. The bullet was accurately located by Dr. Manges in the median line of the skull at a depth of 2 inches from the junction of the lambdoidal and the sagittal sutures. On February 6, 1910, an osteoplastic flap was turned down with the base of the flap over the occiput and search was made by way of the longitudinal fissure. The right hemisphere was retracted outward and the bullet was located by the finger. The bullet was lodged in the falx and was against the superior surface of the straight sinus. The falx was incised and the bullet removed. Bleeding was controlled by a gauze pack, which was allowed to remain nine days. The man was relieved of the torture of violent headaches from which he had been suffering and from a state of melancholia he was restored to perfect health and resumed his work as a stevedore.—(R. S.)

REVIEW. **Hæmophilia.** Progressive Medicine, June, 1910.

The editors of this digest report that the main interest in hæmophilia during the past year has been in serum treatment.

There are still no etiological factors except hereditary transmission.

The theory of Wolf seems the most satisfactory:

> Fibrinogen and thrombogen, both probably of hepatic origin, unite with the substance thrombozyme found in leucocytes, blood plates, and endothelial cells. This combination yields thrombin, which is, in reality soluble fibrin; this, with calcium salts, produces coagulation.
>
> It is further assumed that antibodies, probably also formed in the liver, are at work retarding clotting. Hæmophilia may therefore be looked upon as due to an abnormal increase of these antibodies, rather than to a diminution or absence of the other elements.

The serum treatment seems to be an efficient means for checking the hemorrhage of hæmophilia. The good effects may be due to the leucocytosis which follows an injection of serum or antitoxins. This would, of course, increase the quantity of thrombozyme.

Twenty to 40 cubic centimeters of fresh animal serum have been injected, and ordinary diphtheria antitoxin may be used in smaller doses. The local application of the antitoxin will start coagulation at the bleeding point.

The hæmophiliac is, naturally, a bad surgical risk and victims of this peculiarity will rarely mention the fact; hence the routine examination before operations should include inquiry as to the actual presence of or hereditary tendency to hæmophilia.—(E. T.)

VALLACK, A. S., M. D. **The exclusion of the skin in surgery.** Surgery, Gynecology, and Obstetrics, May, 1910.

The question of infection from the hands of the surgeon has been solved by the use of rubber gloves.

The exclusion of the skin of the patient is no simple proposition and many plans have been tried all based on the fact that germ-containing epithelium is easily rubbed off when moistened with sweat or blood.

The author recalls his suggestion of some years ago of fastening sterile cloth to the cut edges as soon as incision is made and still claims it to be the best method. This prevents all sutures, dressings, and the hands from any contact with the skin.

Doderlein has suggested an ingenious method for excluding the skin by means of a rubber paint which he terms gaudanin. The skin is first "tanned" by painting with a solution of iodine in order to make the paint adhere, and then liberally painted with gaudanin. Doderlein states that when using this method he was unable to obtain cultures from his wounds, though he never failed to obtain cultures when gaudanin was not used, even though his own hands were covered by gloves.

The author states that the gaudanin paint is apt to become detached and does not protect the cut edge of the skin.—(E. T.)

HUBER, FRANCIS. **Removal of foreign bodies from the bronchi.** Surgery, Gynecology, and Obstetrics, May, 1910.

The case reported was one in which a gilt upholstery nail (No. 43) was removed from the right bronchus. The child was 9 years old and had swallowed the tack five weeks previously. X-ray examination showed the tack lodged in the right primary bronchus; the surrounding lung showed infiltration. The bronchoscope was tried unsuccessfully. Through a low tracheotomy wound a pair of alligator forceps was introduced into the trachea, a fluorscopic screen was placed in contact with the anterior surface of the chest and the

X rays were turned on from behind. The shadows of the forceps and the tack were distinctly visible on the screen, and it was an easy matter to grasp the point of the tack and remove it with the forceps. The tracheotomy tube was removed in forty-five hours and the patient made an uninterrupted recovery.

The author states that he successfully removed a rubber drainage tube from the pleural cavity by means of the X ray.

Krukenbery reports a case in which the ether vapor was ignited by the spark from the X-ray machine, so caution in that line is necessary.

In the same journal Robert T. Morris reports a case in which a young woman swallowed a veil pin. The pin had been swallowed about one month previous to operation. Chloroform anæsthesia was used. A low tracheotomy was performed, the trachea was brought forward and held by means of two hooks. With the screen in position, as reported in Dr. Huber's case, a pair of alligator forceps was introduced into the trachea and was passed successfully into the left bronchus, past the second bifuraction into an ascending division of the left bronchus. A diaphragm was used to obtain a clearer definition. The point of the pin was stuck in the side of the bronchus, and it was necessary to carry the pin forward to dislodge it. The pin was then grasped by the point and easily removed.

Morris advises that the alligator forceps be made without serrations, and speaks of the advisability of having an electro-magnet at hand during these operations.—(R. S.)

WILLIAMS, EDITH H. **Some notes on the use of nitrous oxid and oxygen for prolonged anæsthesia.** California State Journal of Medicine, September, 1910.

The writer used the Teter apparatus, which has a transparent face mask, leaving the patient's features and color visible. With this apparatus ether may be added without removing the mask, a definite percentage of oxygen may be added, the gases may be warmed, and may be given under slight pressure if desired (in chest operations).

To adults, morphine one-fourth grain and atropin one one-hundred-and-fiftieth grain were given a half hour before operation.

Results are stated to be highly satisfactory in ordinary operations, the bronchial irritation and subsequent nausea of ether narcosis being entirely absent.

Experimental evidence of the safety of the method has been furnished by Claude Lyons and Martin, each of whom has given a dog nitrous oxid and 15 per cent of oxygen for three days continuously without harmful results. The general safety of nitrous oxid as an anæsthetic when administered with a sufficient supply of oxygen to

prevent all asphyxial complications is shown by the fact that Thomas, of Philadelphia, has administered it 271,940 times, with only one death.

This writer reports the highest success with the method in cases of thyroidectomy; abdominal herniotomy through wound of hysterectomy performed five days before, complicated with sepsis and exhaustion; mastoid operation in child of 8 with acute bronchitis; supravaginal hysterectomy; double decapsulation of kidneys in last stages of nephritis. She agrees with Crile, however, that in major surgery this is "not the anæsthetic of choice for the uninitiated, but only for the highly trained anæsthetist." She summarizes the advantages and disadvantages of this method of anæsthesia in major surgery as follows:

Advantages: No organic degenerative changes follow its use; no harmful blood changes; no addition to shock; no decrease of resistance to infection; no post-operative pneumonia; no nausea and vomiting. Anæsthesia is complete in two and one-half to four minutes. Recovery is almost immediate after withdrawal of the gas. Mortality lower than from any other anæsthetic.

Disadvantages: It is expensive (costs $6 to $9 per hour of anæsthesia). It requires a special apparatus. There is more muscular rigidity than with ether. There is some danger of suboxidation in alcoholic and obese patients. It is contraindicated in serious heart conditions. It requires more skill in administration than ether.—SURG. J. F. LEYS.

SQUIER, J. BENTLY, M. D. **The end-results of prostatectomy.** American Journal of Surgery, July, 1910.

After about 200 operations the author has come to prefer the supra-pubic method of operating, but states that the ultimate result largely depends on the care in curing existing cystitis, in leaving the urethra sound, and in the preservation of the compressor urethræ muscle.

An uncured cystitis will cause constant irritation of the bladder, will prevent healing of the fistula, and may induce the formation of a calculus.

Whether or not permanent postoperative incontinence results depends on the condition in which the compressor muscle is left. This, naturally, is more frequent after infrapubic operations.

Retention may be the result of an otherwise perfect operation. This may be due to a fold of mucous membrane acting as a valve obstructing the internal meatus.

A second form of retention may be due to a scar contracting the vesical neck and closing the internal meatus.—(E. T.)

HYGIENE AND SANITATION.

Medical Inspector H. G. BEYER and Surg. C. N. FISKE, United States Navy.

HOME, W. E., Fleet Surg., R. N. **The ventilation of ships, particularly merchant ships.** The Lancet, September 17, 1910, p. 880.

This paper merits quotation in full; such excerpts as seem particularly applicable to or may suggest better solution of problems on warships are given in place of the customary review:

Each member of the crew adds for his accommodation 2 tons to the bulk of the ship; it will soon be 3, and there are people asking for more. Thus it will be seen how difficult it is for owners to give more room to the men, and for us to get them satisfactory—that is, draftless—ventilation into the very small spaces in which they live. While you, under protest, accept 300 cubic feet as the limit in a common lodging house, and require 600 in barracks, we at sea are jubilant because the merchant shipping act of 1906 has enlarged the minimum cubic space for a merchant seaman, in ships laid down after 1906, to 120 cubic feet, or 3 tons (albeit with deductions), a great advance on the 72 cubic feet formerly prescribed.

This quantity we must dilute with fresh air; but with how much fresh air? In England and America De Chaumont's old standard is still accepted. He found that if the carbonic acid in the air of barracks increased above 0.06 per cent the air was "stuffy," had an unpleasant smell. Accordingly, he—and we follow him—considered 0.06 per cent carbonic acid as the limit of respiratory impurity. The outer air already contains 0.04 per cent, so it can only take up 0.02 per cent more—that is, 1,000 cubic feet will take up 0.2 and 4,000 cubic feet will be required to keep sufficiently diluted the 0.8 cubic foot of carbonic acid produced hourly by the average man. This same amount, 4,000 cubic feet per hour, was also reached by Galton when calculating how much air a man required every hour to prevent the air about him becoming too damp, and by Dr. Shaw when deciding how much is required to keep down the temperature due to many people sitting and breathing together. So it has much sanction, this 4,000 feet of hourly ventilation supply to one man.

In Germany another standard is taken—0.1 per cent carbonic acid, Pettenkofer's original figure, the proportion submitted by Haldane and Osborn as sufficient for factories and workshops. If this be accepted, we see that each 1,000 cubic feet of air can take up (0.1—0.04=) 0.06 per cent of carbonic acid. That is to say, we shall now only want 1,330 cubic feet of hourly supply; and from my experience I would say we shall do very well on a ship if we manage to get as much.

We have agreed that in ships 1,300 feet per head per hour are as much as there is any use asking for. How are we to get that? The first rule of ventilation must be emphasized: "Do good by stealth." As the Greek sage said: "Escape notice throughout your life, otherwise you will find yourself considered a nuisance." A ventilation current that attracts attention to itself ruins its own usefulness by its too great zeal, gets itself disliked, and is probably at once put out of existence. The exceptions occur in the tropics, where a current slightly cooler and with some drying power is greedily welcomed. There is obviously at every temperature a velocity and a cooler temperature of ventilating current that would be just tolerable, slower as the temperature was lower, and conversely. I suppose the limiting condition to be the amount of loss of heat they produce in the time. Dr. Nocht, of Hamburg, in his very valuable book for doctors of ships, "Vorlesungen für Schiffsarzte," says that no velocity above 6 feet a second is endurable; it must be low. People often say that sailors do not like air; that it is no use giving them ventilators as they will only close them up. To talk like this argues a narrowness of view. It is not air men object to, but cold air, especially damp cold air with its higher specific heat, and consequently greater chilling effect;

the up-and-down current no longer interfering with one another; if the diaphragm was removed the candle went out. If a temporary bulkhead or screen were fitted through the hold amidships, leaving a couple of feet clear below, air to get from one side to the other must pass all the way under that screen. A ship is hardly ever the same temperature both sides (action of sun and wind); if the two halves of the hold were separated the air on the sunny side rising would have to be replaced by cold air from the other, which must pass all through the cargo and the hold. At present I expect the change only occurs in that part of the hold upon the water line. The hoped result would follow; I think so from Dr. Shaw's pregnant remark,[1] "Nature provides without difficulty a convection current wherever air is locally warmed." As the temperatures have little difference the currents would be slow; consequently the resistance would be small, and we might be able to make them come, to our advantage, from farther away.

Ventilation would also save money if applied to holds while they are being stowed. It follows, from H. Wolpert's observations (reported by Prausnitz), that a man who sweats as he works is doing less good work than if he were supplied with air, so much and so dry as to prevent the sweat from appearing. If air, then, in volume to prevent this sweating were supplied to the holds they would be stowed more quickly, and the ships get away the sooner. An electrically driven fan at the top of the hatch with a long and large discharge pipe is what is wanted, for with a pipe double the diameter the same power will send down four times the volume of air.

In the artificial ventilation, both of ships and houses, some people prefer the plenum some the vacuum system, and the systems are sometimes pitted against one another as rivals. In fact, they show to much greater advantage when working together. If there is only one system, the pressure required to carry the air through the whole area must be raised twice as high above the normal as is necessary when the air has only to be forced halfway and to be sucked the other half; consequently the installation of power for the combined system is cheaper and the opening of doors and windows produces a merely local effect, whereas with a "single" system it may ruin the ventilation altogether if a window is opened in a tactless place. The Glover-Lyon appears to be an excellent example of the combined system; it emphasizes the need for many apertures in order to prevent draft and the advantage of making large apertures. The trunks should be so arranged that they can be cleaned; the efficiency of ventilation may easily fall 20 per cent through deposit of fluff on the sides. Besides, we all heard how streptococci fell out of the ventilators in that convalescent home at Broadstairs.[2] The trunks should also be as large as possible, for to double the supply costs nothing after the area of the shafts is doubled, the power will remain the same, but to get a double supply with the same shafts as before we must multiply the power by eight. Extended accounts of the ventilation of the very largest passenger steamers have been given at intervals in the last three years by the special sanitary commissioner of The Lancet.

The ventilating mechanisms are specially three: The thermotank, the sirocco fan, and the Utley ventilating sidelight.

The statistics of the ventilation in these large ships are interesting. There are in the *Mauretania* 65 thermotanks, each capable of supplying 33.3 cubic feet per second; this is in all a little over 9 tons of air supplied to the ship a minute. It looks very large, but does only work out at 800 cubic feet of air supplied every hour, artificially, to every person on board, and there is, besides, the natural supply through the Utley sidelights. The ventilation inlet in the cabins is 20 by 8 inches; 800 cubic feet will

[1] Shaw: Air Currents and the Laws of Ventilation, 1907, p. 41.
[2] Brit. Med. Jour., March 26, 1910, p. 770.

pass through this in an hour at a velocity of one-fifth foot per second. This will cause no one discomfort from chill. This good ventilation, as Dr. Nocht remarks, draws passengers, and so is profitable to the owners. To this I need only add the wise conclusion of Dr. Collingridge: "The more comfortable and cleanly forecastles can be kept the more contented and happy men are, the longer they will remain in the ship, and the more work can be got out of them."—(C. N. F.)

JOHNSON, L. W., D. D. S., M. D., United States Navy. **Oral prophylaxis.** International Clinics, Vol. III, 20th series.

In his article covering this general subject Johnson refers to the following points which are pertinent to the naval personnel:

The necessity for early attention to carious molars to prevent unilateral mastication and particularly its consequent unilateral salivary secretion; insufficient admixture of food with saliva and disturbed digestion results.

The usual lack of room for third molars together with "excessive pressure and obstructed blood supply" render these "vestigeal and obsolescent structures" subject to irregularities and early decay; men of the Navy enlist at about the time of eruption of wisdom teeth, which demand correspondingly greater attention on the part of a dentist in the service; an early crucial incision through the gum over the erupting wisdom tooth is advocated to prevent infection of the surrounding tissues; this tooth but rarely performs any functions in speech or mastication.

Ludwig's angina may have its primary focus in a carious tooth.

The saliva of physicians attending infectious disease may be found to contain the causative organism for more than an hour after leaving patients unless some disinfection is practiced.

Such diseases and symptoms as rheumatism, bronchial catarrh, nausea, vomiting, diarrhœa alternating with constipation, gout, and anæmia may have their origin in pyorrhœa alveolaris as well as in tonsillitis.

The teeth of syphilitics require constant care upon the part of patients, and the frequent, if not constant, attention of medical and dental attendants.

In the morning and after each meal Johnson advises as a routine habit rinsing of mouth, brushing the teeth (properly up and down with brushes with pointed tufts) with some such wash as liquor antiseptic alkalinus, and daily massage of gums with the finger tip. "Tooth powders are entirely unnecessary in a well-kept mouth, and the gritty particles are irritating when forced under the gum margins."—(C. N. F.)

BALCK, J. A., Capt., R. A. M. C. **Recruiting in the German Army.** Jour. R. A. M. C., Vol. XV, No. 5, November, 1910.

In Germany the principle that the possessor of political rights must be held available for some military duty is so well applied that in 1906 but 3 per cent of the total 1,145,000 men of 20 to 23 years of age who were required to appear at the "*musturung*" were found "morally or medically unfit" for service in one of the three categories. Of the entire number 55 per cent were excused as wage earners of their families, and of the 42 per cent found fit for service less than 62 per cent (26 per cent of all examined) were required for service with the colors. The remaining 38 per cent of those found fit joined either the "*Ersatzreserve*" or the "*Landsturm*" which constitute the first and second reserves, respectively.

Without reviewing the various classes and terms of service in the subgroups of these three classes it is noted that an Army medical officer serves as expert adviser to the traveling commission which visits all the cities and towns of each recruiting district. Upon his recommendation the men are allotted to the following five classes:

(*a*) Men fit for service with the colors.

(*b*) Men temporarily unfit.

(*c*) Men not fit for the colors but fit for "*Ersatzreserve.*"

(*d*) Men fit only for "*Landsturm*" (called out only if country is in danger):—

1. With arms.
2. Without arms.

(*e*) Men permanently unfit.

The height requirements vary from 69 inches, which at least half the guards and garrison artillery must attain, to 61 inches for the infantry.

For infantry the maximum chest expansion requirements range from 33½ inches for 62 inches of height to 36½ inches for 68 inches of height.

A myopia of less than 6.5 D. or an undescended testicle without complication is no bar to service in the ranks.

The following conditions are no bar to service without arms or in the "*Ersatzreserve:*"

Marked squint, slight kyphosis, unilateral hernia which can be kept back with a truss, hallux valgus, loss of a finger or toe.

The following conditions are no bar to service in the "*Landsturm:*"

Blindness of one eye, deafness less than absolute, otorrhœa, flatfoot, myopia of more than 6.5 D. (provided that in one eye there is visual power of at least one-quarter normal) absence or nondescent of both testes, goiter, compensated heart disease, loss of the trigger finger, double hernia, if it can be kept back with a truss, considerable deformities of hands or feet.

Compulsory service renders the detection of malingering an important part of the examining surgeon's duties and the following methods are cited:

To detect simulated blindness in one eye.—Hold a stick or wooden stethoscope vertically in front of the eyes at a distance of 4 inches (10 centimeters). Tell the recruit to read from a book. If he can manage to do so without difficulty he is using both his eyes.

To detect simulated weak sight of both eyes.—Make the man read the test types in the ordinary way, and note where he stops. Then replace the types by a mirror and place a set of reversed types alongside him, and tell him to read them again from the mirror. If he reads them just as far as before he is malingering, as reflected in the mirror the types are double the distance they were before.

To test hearing in general.—A normal man should hear and understand whispering at a distance of 20 to 25 meters.

To detect simulated unilateral deafness.—Two precisely similar rubber corks are required, one perforated, one solid. Show the recruit the solid one and tell him you are going to stop up his sound ear with it. At the last minute, however, substitute, without his noticing it, the perforated one, and having placed that in the sound ear proceed to test his hearing by whispering. If he says he can not hear anything he is almost certainly lying. Take out the perforated cork, show it to him, and convince him that he ought to have been able to hear. Repeat the experiment, placing this time, without his knowledge, the solid cork in his ear. If he now avers that he does hear after all, he is hearing with the ear alleged to be deaf.

Another method.—Make two narrow paper funnels. Place one in each ear of the recruit, and ask two persons to speak into them, directing them to use different words. Tell the recruit to repeat what he has heard. If he repeats only one work spoken into the ear alleged to be deaf he is convicted of fraud.

A somewhat useful method to test the value of a quickened pulse-beat is to take the pulse when the man is standing and immediately after when he is lying down. With a sound heart there should be a difference of at least 10 to 12 beats.

The medical officer is also called upon to examine members of families to determine physical disability rendering them dependent on the wages of those to be excused from service as wage earners.—(C. N. F.)

BIERHOFF, F., M. D. **Concerning the sources of infection in cases of venereal diseases in the city of New York.** N. Y. Med. Jour., Vol. XCII, No. 20, November 12, 1910.

A classification of prostitutes and others to whom 1,429 gonorrheal infections were attributed in three different sections of the city and in private practice shows that infection was traced to public prostitutes (street, brothel, kept, unclassified, "friend," "mistress").

Out of a total of 1,429 cases, in 74 per cent; 527 first infections in 79 per cent; 902 later infections in 71 per cent; 370 cases in private practice in 64 per cent.

These figures were gathered and grouped to show how comparatively few infections were from nonpublic women, whose individual rights might be considered as abridged in the new law which pro-

vides for the medical examination of prostitutes and the commitment of the diseased to hospital; the conclusion is that "the public prostitute is, in this city, by far the most prolific disseminator of venereal disease."—(C. N. F.)

WHYTE, G. D. **The effect of a mosquito net on the air within it.** British Medical Journal, October 1, 1910.

In this abridged report, based upon 80 analyses of the air inside and the air outside the net at Swatow, China, Whyte determined that there was, after a night's occupancy, no difference in the amount of CO_2 within the net (80 cubic feet) and in the room (1,500 cubic feet), regardless of amount of ventilation. The organic matter retained in the net, representing respiratory vitiation, on the contrary, was found by the Forchammer process to be greatly in excess of and averaging double that in the room outside, the excess depending upon ventilation and temperature. In cold weather the 100 cubic centimeters of distilled water shaken in a 5-liter amber jar of air absorbed 0.11 to 0.23 milligram of oxygen from potassium permanganate, while the air outside the net appeared free from organic matter. In warm weather, 35° to 37° C., 0.2 to 0.7 milligram more oxygen was absorbed by the specimen collected in the net than from the air outside.

With good ventilation, temperature 30° C., the specimen inside the net absorbed 0.59 milligram of oxygen, as compared with 0.13 milligram outside; with poor ventilation the specimen from inside the net absorbed 0.80 milligram as compared with 0.41 milligram outside; with moderate ventilation the specimen from within absorbed 0.65 milligram as compared with 0.39 milligram outside.

One must not say, "There were only 0.014 part of organic impurity in the air." Such a statement is quite unjustifiable. Of all the impurities in the air only a certain proportion were absorbed by the distilled water; only some of the impurities thus absorbed were incompletely oxidized, and these incompletely oxidized impurities are the only ones that possess the power to reduce potassium permanganate. Thus it is only a fraction of a fraction of the impurity of the air that we have been able to make a rough estimate by this modification of Tidy's process. * * *

We have not done our best for a patient when we have obtained ample ventilation for the bedroom unless we have also secured that he is no longer poisoning himself by inhaling the waste products that are accumulating within his mosquito net.

In some cases of tuberculosis it will be found best to dispense with the net and make use of preparations of oil of citronella, etc., to secure freedom from mosquitoes.

The author does not state that harm was actually incurred by the occupants of the nets, the material from which the mosquito bars were made, or suggest methods for improving ventilation, such as the blackened funnel extended from above the habitation to create an upward draft during sunlight nor any means for absorbing or

rendering inert this organic content of the air. A literal interpretation of one of the opening statements will hardly be conceded by all: "The other points wherein expired air differs from pure air, namely, added moisture and increased temperature, are obviously of small moment."—(C. N. F.)

TROPICAL MEDICINE,

Surg. C. S. Butler, United States Navy.

Acton, Hugh W., I. M. S. **The rationale of quinine prophylaxis.** Indian Medical Gazette, Vol. XLV, No. 8, 1910, pp. 283–287.

The author points out the present-day lack of exactness of dosage in the quinine prophylaxis of malaria in India, and sums up a few of the many ways of administration in use. He gives as the cause of the chaotic state of knowledge on this question, the lack of appreciation that we deal with three types of malarial fever, each having a different period of incubation, and each species of parasite having a different power of resistance to quinine. Further, no help is given by statistics, dosage and species of parasite not being indicated. Other sources of statistical error are due to alteration of returns and the "fashionable diagnosis" *papatasi fever*. Fortunately the facts in connection with this branch of prophylaxis are known, and we can apply this knowledge personally without following blindly any one method. Golgi showed that quinine acts upon the plasmodium with an effectiveness in inverse proportion to the parasite's age, being most intense on the merozoites and young trophozoites, less intense upon mature trophozoites destined to form schizonts or sporonts, and appears to have no action whatsoever upon the sporonts of malignant tertian. In case of the sporonts of benign tertian fever the author has observed, within a few hours "after 10 grain quinine doses, t. d. s.," deficiency of parasitic chromatin and protoplasm staining, increase in perichromatin vacuole, and progressive degeneration of these gametes, together with the disappearance (within 24 to 48 hours) of the parasite from the peripheral blood. The sporonts of malignant tertian, on the other hand, he has observed undiminished in number despite three to six weeks of dosage of quinine in 30-grain-daily doses. Golgi observed also that (aside from the sporont forms) quinine affected benign tertian parasites most intensely (probably due to greater osmosis from plasma into the hydræmic corpuscles), quartan next, and malignant tertian least. Laveran (dealing with malignant tertian) found that quinine in doses of less than 8 grains, even in the endoglobular stage, had no effect, and that 2-grain doses actually increased their resisting power. This is not correct for benign tertian, in which the disappearance of young trophozoites

from the peripheral blood within 24 hours of a single 5-grain portion of quinine is a common experience. These facts show that 5 to 10 grains is the smallest dosage to be relied upon in benign tertian, and for malignant tertian at the height of its incident period 10 to 15 grain doses would be required.

The next point is the interval of administration of these amounts in order to accomplish efficient prophylaxis with minimum dosage. By experimental infection, using mosquitoes and experimental inoculations, the average incubation periods for the three types of malaria have been determined. The minimum in days (figures of several different observers) is: For quartan, 11; for benign tertian, 3; and for malignant tertian, 3. Clinical evidence of some importance bearing upon the incubation period in natural infections of benign and of malignant tertian is adduced by the author. As mosquito nets are not supplied to the regimental hospitals for Indian troops, and as, in the malarial season, these hospitals have many malarial patients (benign and malignant tertian infections) and many anopheline mosquitoes, conditions simulating those of an epidemic—as dissection of a few hospital mosquitoes will show—nets are furnished patients admitted with diseases other than malaria. Thus with four patients admitted with other diseases, a careful study of the blood for parasites, pigmented leucocytes, mononucleosis, and basophilia, and of the urine for the presence of urobilin (Schlesinger's method), as well as of the history of patient for former malaria was made. No evidence of then existent nor of former malaria was adduced (confirming Plehn's view regarding absence of signs in blood or urine during primary incubation period). At the time of admission of these cases there were patients in the hospital suffering, some from benign and some from malignant tertian (and presumably also infected mosquitoes). One of the four cases came down on the sixth day and one on the seventh with malignant tertian, while a third came down on the eleventh, and the fourth on the fourteenth with benign tertian. From all the evidence it may be concluded that benign tertians have an incubating period of about 11 days, benign quartans of about 14 and malignant tertians of about 6 days (there may be three species of malignant tertian parasite with slightly differing incubation periods). Taking into consideration then the action of quinine upon the parasites and the incubation periods, it follows that the dose should be administered 48 hours before the fever would develop. Thus it is necessary to administer the drug every 8 days if we are protecting against a pervading benign tertian, every 4 days if against a malignant tertian, and every 11 days if in an epidemic of quartan. If malaria is very prevalent and the sporozoite index high, these periods should be shortened by 2 days. Clinical evidence shows

double tertian infections to be so common that 2-day consecutive prophylactic doses of quinine would be safer. Hence the following rules:

(*a*) When benign tertian infections are prevalent (i. e., when they form 70 per cent of the weekly malarial returns) two consecutive doses of 5 to 10 grains should be given at intervals of eight days, but if the epidemic is a severe one, the intervals may have to be shortened to six days.

(*b*) When malignant tertian infections are prevalent (i. e., when they form 30 per cent of the cases or over) two consecutive doses of 10 to 15 grains should be given at intervals of four days, but if the epidemic is a severe one, these intervals may have to be shortened to two days and the maximum dose given.

In order to carry out these rules it is necessary to know the incidence of the districts. This can be gotten by examining the blood of all fever cases microscopically, over a period of a year. A rough idea may thus be gotten. From the scanty data available, it appears that the author's method of quinine prophylaxis, if employed alone, can not absolutely control an epidemic, but among troops and in jails he states that it can—

(I) Decrease the number of malarial cases by about 50 per cent to 80 per cent at the very most, and this only when the dose is given regularly and in an adequate manner as pointed out above.

(II) It undoubtedly decreases the gravity of the cases, and hence among troops we get a very low mortality.

(III) By decreasing the actual number of cases, it would of course limit the extent of the infected feeding grounds for the anopheles to browse upon. But in regimental lines the women and children are not treated efficiently, and consequently always form potential foci for an epidemic to occur. In a like manner the cases harboring sporonts in the blood should always be isolated until their blood is declared free of crescents.

The infectious nature of malaria should be more widely recognized, all cases harboring sporonts segregated, and protected by mosquito nets. They should be regarded in the same light as chronic bacillus carriers.—(C. S. B.)

Ross, Ronald, and Thompson, David. **A case of sleeping sickness studied by precise enumerative methods: Regular periodical increase of the parasites disclosed.** Annals of Tropical Medicine and Parasitology. Series T. M., Vol. IV, No. 2, pp. 261–265.

For a long time Ross has thought that much might be learned about infectious diseases by exact enumeration of the infecting organisms. The usual enumeration methods are not sufficiently exact. One of the authors (Ross) has devised a method whereby larger amounts of blood can be studied and the parasite content more precisely fixed. Using this method upon a patient suffering from sleeping sickness over a period of several months it was established that trypanosomes varied

considerably in number in the peripheral blood. The lowest recorded count was less than 100 parasites per cubic millimeter. There were regular variations in this matter, a high count being followed by several days of low count, the tracing showing two apices, a high succeeded by one or more lower apices, as if there were infection by different broods of parasites flooding the peripheral blood in different numbers on different days. A parallel temperature chart shows regular rises and falls of fever corresponding to the rises and falls of parasite content in the peripheral blood. The method enables the observer to detect parasites when by the ordinary methods they would probably have been detected only at the crests of the rises.—(C. S. B.)

CHAMBERLIN, W. P., Maj., Medical Corps, United States Army. President of the United States Army Board for the Study of Tropical Diseases as they Occur in the Philippine Islands. **Statistical study of uncinariasis among white men in the Philippines.** Philippine Journal of Science. Vol. V, No. 3, August, 1910.

After an extended study of this disease as it exists in natives and Americans living in the Philippines the author reaches the following conclusions:

1. Uncinariasis is found among the Filipinos in probably not over 15 per cent of the general population and is mild in type and of small economic importance.

2. The percentage of infections is higher in adult males, reaching 50 or 60 per cent among the Filipino Scouts and Bilibid prisoners.

3. The average percentage of infection of the white population of the southern part of the United States is probably much higher than the rate among the Filipinos.

4. From 65 to 85 per cent of the southern-bred white recruits for the United States Army are infected with uncinaria, usually mildly, and these infected soldiers have been coming in considerable numbers to the Philippines, thus importing *Uncinaria americana*.

5. The majority of these soldiers, if not reinfected, become free from the worms by natural processes in about five years.

6. Uncinariasis, sufficiently marked to be evident clinically, is very rare among American men in the Philippine Islands.

7. Even a routine stool examination among Americans shows few cases, 71 out of 8,000 examinations at the Division Hospital and 19 out of 800 examinations at the Fort William McKinley Hospital.

8. An exhaustive stool examination among Americans in the Philippine Islands would probably show a somewhat greater frequency.

9. Of the 90 cases of uncinariasis found at the above hospitals, only 11 were admitted for uncinariasis. Forty-five were admitted for gastrointestinal troubles, dysentery, diarrhœa, and sprue being the most frequent causes.

10. In 30 out of 90 cases (33 per cent) there is a probability that the infection originated in the United States and was imported into the Philippine Islands.

11. In the remaining 60 cases it is probable that infection occurred in the Philippine Islands, and there is reason to believe the parasites were usually introduced through the mouth with food or water.

12. Uncinariasis is of sufficient importance among Americans in the Islands to make an occasional careful search for ova desirable.—PASSED ASST. SURG. J. L. NEILSON.

PATHOLOGY AND BACTERIOLOGY.

Passed Asst. Surg. O. J. MINK, United States Navy.

SCHWARTZ, B., M. D. **A case of typhoid meningitis.** Medical Record, New York, October 29, 1910.

The author reports a fatal case in which the typhoid bacillus was obtained in pure culture in the spinal fluid.—(O. J. M.).

BUERGER, L., M. D., and KALISKI, D. J., M. D. **Complement fixation in thromboangiitis obliterans.** Medical Record, New York, October 15, 1910.

The complement-fixation test was performed in 29 cases by the Wassermann and Noguchi system and all were negative although frequently repeated over a considerable length of time.—(O. J. M.)

WOLBARST, A. L., M. D. **Personal observations on the Ehrlich-Hata "606."** Medical Record, New York, October 15, 1910.

Under one section of his paper the author speaks of the "effects on the Wassermann reaction:"

In most cases the reaction changes from positive to negative after 6 to 8 weeks. It may remain positive a short time after clinical symptoms have disappeared. The change is considered to be due to a destruction of the spirochætes.

A dose of 0.6 gram causes the reaction to disappear in from 30 to 60 days. Herxheimer believes that three-fourths of the cases become negative within 50 days. Usually the larger the dose the more rapidly and certainly the reaction becomes negative.

The change is more apt to occur in primary than in late lesions.—(O. J. M.)

KENDALL, A. I., Ph.D. **Certain aspects of the bacteriology of bacillary dysentery.** Boston Medical and Surgical Journal, September 8, 1910.

Bacteria of the coli and dysentery type in the presence of protein and carbohydrates act principally and preferably on the carbohydrate using only enough of the protein to satisfy their nitrogen requirements. As the toxic products come principally from the protein constituents these may be greatly reduced if a utilizable sugar is present. In bacillary dysentery, a sugar should be furnished (1) to prevent depletion of body protein, (2) to prevent excessive formation of toxines (3) so that the decomposition products of carbohydrates as the lactic acid produced by the colon bacillus may act as an antagonist of the dysentery bacillus.—(O. J. M.)

KENDALL, A. I., Ph.D., and SMITH, R. M., M. D. **A rapid presumptive test for diarrhea caused by the gas bacillus.** Boston Medical and Surgical Journal, October 13, 1910.

It has been definitely shown that the gas bacillus or *B. Welchii* may be the causative factor in some cases of diarrhea.

Some of the stool is inoculated into sterile tubes of whole milk, then heated to 80° C. for 20 minutes, and incubated for 24 hours. Positive cultures of *B. Welchii* at the end of 24 hours show (*a*) the casein is largely dissolved; (*b*) residual casein is slightly pink and filled with holes; (*c*) a rancid butter smell due to the formation of butyric acid. Gram stains show thick short bacilli with rounded ends. *B. subtilis* gives a pseudoreaction, but the three points abovementioned are not characteristic.

In 231 infants with intestinal disorder the gas bacillus was isolated 22 times. From none of the 22 cases was it possible to isolate simultaneously the dysentery bacillus.

The buttermilk treatment was used in only a few of these cases but proved very satisfactory.—(O. J. M.)

ALEXANDER, D. M., M. D. **An investigation into the acid-fast bacteria found in human feces with special reference to their presence in cases of tuberculosis.** Journal of Hygiene, Cambridge, April, 1910.

Conclusions:

The feces of 23 cases of pulmonary tuberculosis, in which acid-fast bacilli had been demonstrated by the microscope, have been proved capable of infecting guinea pigs with tubercle.

One hundred and twenty-nine samples of feces from nontubercular individuals have been examined microscopically and no acid-fast bacilli demonstrated.

The inference follows that all acid-fast bacilli in the feces are tubercle bacilli.

Acid-fast oval bodies are found frequently, but their nature is unknown.

The tubercle bacillus was discovered 52 times in the feces of 74 cases, certainly tubercular.

There is an intermittency in the appearance of tubercle bacilli in the feces, which may be connected with the flow of bile. This explanation is supported by the action of the cholagogue, calomel.—(O. J. M.)

HEWLETT, R. T., M. D., VILLARS, S., F. R. C. V. S., and REVIS, C. **On the nature of the cellular elements present in milk.** Journal of Hygiene, April, 1910.

Conclusions:

It is difficult to formulate any general conclusions from this survey of the kinds of cells present in different conditions. All that can be said is, that in the milk of healthy cows in full milk and which do not give a high cell count, the majority of cells tend to be of the type termed "large uni-nuclears," with a small admixture of other cells. At the beginning and end of lactation, or when the cell count is high, the multinuclears tend to be the prominent cell, and this is the case whether the high cell count

is without discernible cause, or whether a definite mastitis is present; that is to say, a high cell count seems to be due to an increase of the multi-nuclears, and may or may not be associated with mastitis. These conclusions are in accordance with the hypotheses we have put forward as to the effect of various stimuli on the gland tissues of the udder. Substituting the word "polymorphonuclear leucocyte" for "multi-nuclear cell" our results are in general in accordance with Savage (1908, p. 33), but we differ entirely as to the nature and origin of the actual cellular elements. Even in the deposits from the serous fluid in catarrhal mastitis we do not find the presence of polymorphonuclear leucocytes, and must conclude that the cells of deposits are not "pus cells" in the ordinary acceptation. It is not in our opinion possible to recognize diseased conditions by means of a microscopical examination of the cells present.—(O. J. M.)

SMITH, ALLEN J., and WEIDMAN, F. D. **Infection of a stillborn infant by an amœbiform protozoon (*Entamœba Mortinatalium*).** Univ. of Penn. Med. Bull., July-Sept., 1910.

Weidman delivered a stillborn child on January 30, 1910. As there was nothing unusual in the appearance of the dead fetus, the usual amount of tissue was fixed from the several organs. In the course of the routine examination of this tissue certain peculiar bodies were noticed in the liver, kidney, and lung (but not in heart muscle, spleen, or pancreas). These bodies form the basis of this paper. In the three organs found infected a minor congestion was observed, and in the kidney and liver a moderate cloudy swelling of parenchyma cells. In kidney just visible to the unaided eye, attention was called to a minute focus of lymphocytes in the interpyramidal cortex. This proved to be composed almost entirely of small, round, mononuclear cells with a few polynuclears, and close by in a dilated renal tubule were half a dozen prominently nucleated cells which the authors determined to be protozoa. In the same block of kidney tissue other similar foci of round cells were found, and always in the tubules of the vicinity from a few to many of the same protozoa. These protozoa were also found in the tubules deeper in the cortex extending toward the medulla, and many not having the vicinal round celled collection described. In the block of liver tissue only a single undoubted organism was found lying in a focus of lymphoid and polynuclear cells at the margin of a liver lobule. In the lung tissue examined many of these bodies were found. They were always in the air vesicles and there was no tissue cell reaction to mark their whereabouts as in the kidney and liver.

The protozoa are round, oblong, pyriform, or irregular (due to pseudopodia). They vary from 0.038 by 0.025 millimeter to 0.022. One or two short, thick pseudopodia occasionally noted. Differentiation into endo and ectosarc not constant. Occasionally a border of ectosarc can be seen extending around organism, a larger amount of ectosarc may be massed at base of pseudopodia. The endosarc is

more coarsely granular and often contains deeply staining granules (chromidia) varying from a few to a great number. Vacuoles are frequently seen, but it is difficult to decide whether they are true vacuoles or evidence of disintegration. Occasionally evidence of phagocytosis by protozoa is shown by red blood cell inclusions. The organism is mononuclear; the nucleus measures one-third to one-half of cell diameter, has a coarsely granular central body and little chromatin, which is surrounded by a poorly staining zone often showing chromatin threads and granules. The nucleus is spherical or oval and the central body similar. No evidence of nuclear division was observed. In a few there was a suggestion of a nucleolus in the central body. It was not possible to recognize micronuclei in any of the preparations. The organisms may encyst, the cyst wall showing with hæmatoxylin and eosin as pale, eosin tinted, refractile, double-contoured covering. The staining reactions after Müller-formol fixation with iron hæmatoxylin and acid fuchsin clearly differentiate nucleus, chromatin, and cytoplasm. The authors conclude that there can be no doubt of the protozoal nature of this organism nor of the infection of the fetus having occurred before death. They consider the question of the proper systematic position of the parasite and, while appreciating that parasitic protozoa are all liable to have an amœbiform stage, they nevertheless place this organism in the order *Amebina* and tentatively call it *Entamœba mortinatalium*. In a supplementary note to their reprint, the authors state that they believe this parasite to be the same as a body described by Ribbert in 1904 as occurring in the kidney tubules of a syphilitic newly born infant which he had studied some twenty years before the publication of his article.—SURG. C. S. BUTLER.

MEDICAL ZOOLOGY.

Passed Asst. Surg. P. E. GARRISON, United States Navy.

CARTER, R. MARKHAM, M. B., M. R. C. S., Eng., L. R. C. P. Lond., D. T. M., Liverpool; Captain, Indian Medical Service; Officiating Director, Pasteur Institute of India. **Ulcerating granuloma of the pudenda a protozoal disease. Preliminary communication.** The Lancet, London, October 15, 1910, p. 1128.

The author states that, contrary to prevailing belief, ulcerating granuloma of the pudenda is not a venereal disease. Though the genitals and contiguous parts are usually the seat of infection, the disease is contagious and is autoinoculated by the patient in other parts of the body, having been seen on the cheek, buttock, etc. It is usually seen in adults, and race is not an essential etiological factor. In sections stained by Giemsa's method or with methylene blue and eosin the author found small bodies resembling those found in oriental sore and which he considers a *Herpetomonas* or a *Crithidium*.

He says: "The parasites are found in large swollen cells, in which the nucleus is pushed to one side of the cell. The cytoplasm of the infected cells contains from 15 to 50 protozoal parasites arranged roughly in groups of 15 to 20 round a central homogeneous mass resembling the zooglœa mass of *Leishmania* in cultivation. No flagella have been noted, but the fact that a deep staining dot lies external to and in close relationship with what seems to be the more mature form of the parasite is highly suggestive. The nuclei of the parasites stain a deep reddish violet, the dot almost black violet, and the cytoplasm of the parasite pale blue. The rest of the tissues in the neighborhood of the infected area stain light blue. Each parasite seems surrounded by a faint unstained area suggestive of the similar appearance seen in staining for Negri bodies."

Further than stated above, this preliminary communication does not give the author's reasons for considering the disease nonvenereal in character.—(P. E. G.)

BASS, C. C., M. D., and GAGE, J. M., M. D., New Orleans. **Report of 15 cases of Hymenolepis nana.** New York Medical Journal, October 15, 1910, p. 769.

This report of 15 additional American cases of infection with the "dwarf tapeworm" found in examining the stools of 577 persons (2.6 per cent) further emphasizes the very probable importance of this parasite as an intestinal infection in the United States. Ransom in 1904, in a monograph upon the subject of *Hymenolepis* in man, was able to gather record of about 25 American cases, all but one of which had been found since August, 1902. Deaderich in 1909, reported two new cases and collected reports of 31 other cases in the United States. During the present year Schloss added 20 cases in children in New York. Thus at least something over 50 cases of dwarf-tapeworm infection have been reported within the last eight years, while that of Spooner, Philadelphia, in 1872 was the only case known for the United States before 1902. The authors emphasize the point made by Stiles that in the anthelmintic treatment of these infections the worms may be broken up into pieces too small to be seen with the naked eye and may therefore be overlooked in searching the stool for the parasites. They insist also upon the value of centrifuging the feces in examining them for ova. All reports strongly indicate that *Hymenolepis nana* is the commonest tapeworm of man in the United States, especially in the Southern States and among children. Ten of the 15 cases of Bass and Gage were said to have presented more or less severe symptoms attributable to the tapeworm infection. Four of the cases gave a history of convulsions. Two others had marked nervous disorders.—(P. E. G.)

CHEMISTRY AND PHARMACY.

Asst. Surg. E. W. Brown and Pharmacist O. G. Ruge, United States Navy.

Reprints from Chemical Abstracts (American Chemical Society, vol. 4, Nos. 13, 14, and 15):

Fleisher, M. S., and Loeb, L. **Studies in edema. VI. The influence of adrenaline on absorption from the peritoneal cavity, with some remarks on the influence of calcium chloride on absorption,** Lab. Exp. Path., Univ. Penn. J. Exp. Med., 12, 288–310.

Definite amounts of 0.85 per cent NaCl solution, 1.2 per cent NaCl solution, distilled H_2O, and NaCl and $CaCl_2$ solution were injected intraperitoneally into rabbits with and without adrenaline. The results were as follows: Adrenaline injected intraperitoneally increases the rapidity of absorption of fluid from the peritoneal cavity, independently of whether the solution to be absorbed is hypotonic or hypertonic or approximate isotonic with the blood serum. Intravenous injection of adrenaline also increases the absorption of fluid, but not so markedly as the intraperitoneal injection. In either case it increases the amount of NaCl absorbed. The relative absorption of NaCl as compared with that of water, is slightly increased when 0.85 per cent NaCl solution and adrenaline are injected intraperitoneally; but diminished when the adrenaline is given intravenously, or when 1.5 per cent NaCl solution and adrenaline are injected. When water is injected intraperitoneally, adrenaline decreases the relative amounts of NaCl in the peritoneal fluid, a fact apparently related to increased excretion of NaCl through the kidneys. With intraperitoneal injections of 0.85 per cent NaCl, the blood becomes diluted after 2½ hours. This dilution is less marked when adrenaline is also injected. With H_2O the dilution is equal in control and in adrenaline experiment. The increased absorption from the peritoneal cavity caused by adrenaline is not due to increased diuresis caused by this substance but probably related to it. Adrenaline causes temporary increase in the osmotic pressure of the blood which gradually returns to normal. Under certain conditions there is a tendency to maintain this higher level, which may be the main factor in increasing the absorption of fluid from the peritoneal cavity. With 0.85 per cent NaCl with or without adrenaline, there is a tendency of the peritoneal fluid to attain a higher osmotic pressure than the blood serum similar to the ascitic fluid in man. This is due to a mechanism present in the normal animal that causes passage of electrolytes from the blood or tissues into the peritoneal cavity. Addition of 1.22 per cent $CaCl_2$ solution to the 0.85 per cent NaCl solution delays the absorption of fluid but slightly. W. A. J.

Tomasczewski. **The action of mercury and iodine in experimental syphilis.** Univ. Polikl. Haut-Krankh., Berlin. Deut. med. Wochschr., 36, 653–7.

Hg shows a preventive action after large doses are given in the case of rabbits infected with syphilis. This action depends in part on an increased resistance of the organism, partly on developed retarding factors, but principally on a specific bactericidal power. I shows no preventive action. Monkeys and rabbits become ill within the normal period even when treated with I from the moment of infection with syphilis. The syphilitic symptoms in animals treated with I are cured in a short time by Hg treatment. The action of the I is indirect and is far from characteristic. F. C. Cook.

Geissler, W. **A protein reaction in the blood of the insane.** Psych. Kl. Kölner. Akad. Prak., Med. Münch. med. Wochschr., 57, 785–9.

The precipitin reaction is described in detail. Antigens were prepared by injecting the blood from insane patients into rabbits. When the blood serum of patients suffering with the insanity of pubescence, katatonia, and dementia paranoides was injected,

antibodies were formed in the rabbits' serum. Substances are present in the blood serum of persons suffering with the insanity of pubescence and katatonia which are not found in normal sera. The substances found in the sera of these two diseases are not entirely alike but they can be demonstrated to be present by the precipitin test. The sera of healthy persons and those suffering with other forms of insanity do not show this reaction. It remains for future tests to establish the reliability of these tests. F. C. Cook.

SELIGMANN, E., and PINKUS, F. **Chemistry of the "antigen" used in the Wassermann reaction.** Untersuchungsamt, Berlin. Z. Immunität., 5, 377–403.

The active watery extracts from syphilitic and from nonsyphilitic organs are alike in all respects; the alcoholic extracts are likewise similar to each other, although they differ from the watery extracts in being less affected by heat. Therefore the authors find no support for the view that syphilitic organs contain a specific antigen which takes part in the Wassermann reaction. The active lipoids are phosphatides which are not extracted from organs by simple ether extraction, but they dissolve out only after a preliminary treatment with alcohol; apparently the extraction is also favored by autolytic disintegration of the organ, explaining why macerated luetic livers give such active extracts. Probably the active lipoids belong to the diaminophosphatides, which are bound more firmly in the tissues than the monoaminophosphatides; hence watery extracts are only active when the liver cells have been disintegrated by disease, maceration, etc., while alcoholic extracts are always active. It is the presence of proteins which are bound to the lipoids which renders the watery extracts thermolabile; the lipoids in alcohol extracts, being free from proteins, are not inactivated by boiling temp. H. G. Wells.

ROSENDAHL, A. **A lack of oxygen not the cause of death in cases of diminished air pressure.** Physiol. Inst., Univ. Bern. Z. Biol., 52, 16–40.

Rats which suffer in rarefied air recover when normal pressure is restored by introducing N. Rabbits are more susceptible and show signs of dyspnea in 13–30 min. after adding N. Rats and rabbits become dyspneic in O when the air pressure is appreciably lowered, even if the partial pressure of the O is increased 3 or 4 fold higher than that of atmospheric air which is so diluted that it produces apnea. Animals tolerate greater air pressure in O than in atmospheric mixtures of O and N, because an atm. with highly conc. O favors the diffusion of the O to the venous blood and the combination of the blood of the lungs with CO_2. These results do not coincide with the theory that dyspnea in rarefied air is caused by a lack of O. The diminished air pressure may mechanically prevent the normal circulation of the lungs. F. C. Cook.

BRAUER, A. **Influence of mercury on the results of the serum reaction in antisyphilitic treatment.** Kgl. Univ. Kl. Haut. Krankh., Kiel. Münch. med. Wochschr., 57, 905–7.

The relation of the amount of Hg excreted to the results of the Wassermann reaction was studied. In 68 cases of syphilis the Wassermann reaction and the Hg content of the urine was studied and no such relation was found and no relation was observed between this reaction and the amount of Hg retained in the organism. The complement-combining substance is a direct or indirect reaction product of the virus, and is not a part of the virus alone or of the syphilitic poison. The author concludes that a positive reaction is accompanied by a large excretion of Hg, a negative reaction by a small Hg excretion. A negative reaction can become positive in spite of the presence

of small or medium amounts of Hg in the blood. A reaction which under treatment has become negative can become positive in spite of the presence of Hg. The Hg present in the blood of a treated syphilitic patient is not able to destroy or to paralyze the complement-combining substances in the serum of a syphilitic patient who has not been so treated. The theory of Epstein and Pribram based on the action of Hg on the complement-combining substances in rabbit sera is shown to be untenable for man. The Hg content of the organism has no direct influence on the outcome of the serum reaction. Hg has only an indirect influence on this reaction as it seizes upon the syphilis virus itself and not the complement-combining material. F. C. Cook.

MATTICE, A. F. **Quantitative determination of albumin in the urine.** Clin. Lab. Johns Hopkins, and Lab. Physiol. Chem. Mount Sinai Hosp., New York City. Arch. Int. Med., 5, 313–24.

Mattice finds Tsuchiya's reagent (phosphotungstic acid 1.5 grams, conc. HCl 5 cubic centimeters, and alcohol 100 cubic centimeters) much more accurate than the Esbach for a quantitative estimation of albumin in urine. Tsuchiya's solution does not stain the hands; it keeps well; it can be used in the ordinary Esbach tube; readings are not influenced by changes in temperature; foaming or floating of the ppt. is rarely seen; it can be used for large as well as small amounts of albumin without dilution of urine; presence of sugar does not influence the readings. M. M. Scarbrough.

EYE, EAR, NOSE, AND THROAT.

Surg. E. M. SHIPP, United States Navy.

HARMAN, N. BISHOP, M. A., M. B., Cantab., F. R. C. S., England, and MORTON, E REGINALD, M. D., Toronto, F. R. C. S., Edinburgh. **The use of carbon dioxide snow in eye work.** The British Medical Journal, October 29, 1910.

The writers state that among the newest of new remedies for external diseases is the application of carbon dioxide snow which has been used in capillary nævus, papilloma, rodent ulcer, and quite recently the authors have used it in the treatment of trachoma.

The efficacy of this caustic can be gauged by the fact that Morton, E. R., has treated over 200 capillary nævi with 90 per cent of cures at the first application. They further state that the rationale of the usage of the snow is easily understood, intense cold being as destructive to living tissues as is heat and after the withdrawal of the destroying influence the destroyed part is exfoliated by the reaction of the surrounding undestroyed tissues. But its action need not necessarily be destructive to the tissues to which it is applied, for the duration of its application, and therefore of its action, can be regulated to a nicety so that every degree of reaction can be obtained from a scarcely detected blanching at the point of contact with a subsequent sign of reaction in a delicate blush to the complete freezing of the tissue and its almost instantaneous death.

The authors give the following description of the preparation and use of the snow:

No other appliances are necessary for the production of the snow than the usual iron cylinder containing the compressed gas, a towel, a cork, a brass tube, and a ruler that will fit into the tube. The towel is rolled loosely around the ruler, the ruler withdrawn, and the resulting tube of toweling closed at one end with the cork. The towel-tube is held mouth up beneath the vent of the gas cylinder which, being opened, emits the gas into the tube wherein a large deposit of snow appears. This is removed from the towel, broken up and then shaken into the brass tube and rammed down with the ruler. To make the snow pencil quite hard it may be hammered forcibly into the tube. Then the pencil is pushed out from the tube by the ruler. The snow pencil can be handled safely or covered with lint; its extremity can be cut with a penknife to any desired shape.

The hard pencil will last for effective use for one to two hours. In treating new growths the pencil is shaped to the surface to be treated and then pressed down on the tissue for about forty seconds; this is sufficient to completely freeze the tissue.

In treating trachoma the lid is everted and separated from the globe by a nonconducting spatula, then the pencil is lightly pressed upon the portion of the conjunctiva selected for treatment for from 15 to 30 seconds for the shorter time at the beginning of the course, the longer time after a graduated increase with each weekly sitting. In the use of carbon dioxide snow the writers state that two extremes of effect have been made use of: In the case of trachoma the action is of a delicate order and is used to promote a well-defined shock to the tissues with a subsequent brisk reaction. No actual destruction of the tissues is permitted.

In the case of papilloma and rodent ulcer an action of the snow just short of its full extent is obtained, to insure the death of the new growth without damage to the surrounding healthy tissue.

In trachoma the duration of the application at each sitting is short and repetitions are frequent; in the case of new growths one full application is sufficient to obtain a cure where the growth is of small size.

The application of solid CO_2 was found to be almost painless and the thawing out of the tissue was disagreeable for only a few minutes. The great advantage in eye work was the ease and certainty with which the reaction could be circumscribed and controlled as to depth and intensity. The greatest advantage of all was its efficiency.—(E. M. S.)

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DINKELSPIEL, M. R., M. D. **Preliminary communication of a new method for the prevention and treatment of sympathetic ophthalmitis.** Journal of Ophthalmology and Oto-Laryngology, November, 1910.

The author states that the object of his brief preliminary communication is to bring to the attention of the profession the results of a new therapeutic procedure for the prevention and treatment of sympathetic ophthalmitis and certain disease of the uveal tract which has given striking results in a series of cases recently under treatment by him.

The treatment consists in the administration of large doses of urotropin; the adult doses administered by writer having been from 40 to 80 grains per day, in 10-grain doses. Under this treatment he has observed sympathetic ophthalmitis and iridocyclitis associated with hypopyon clear up without any other constitutional medication except an occasional purgative.

The author also expresses the opinion that whether the exciting agent in sympathetic ophthalmitis is transmitted through the head stream or by continuity through the brain the drug can reach the course of invasion by either route, as the researches of Crowe (Johns Hopkins Bulletin, April, 1909) show that urotropin is excreted in the cerebrospinal fluid.—(E. M. S.)

REPORTS AND LETTERS.

A VISIT TO THE LEPER SETTLEMENT, MOLOKAI, HAWAII.

By Medical Inspector J. D. GATEWOOD, United States Navy.

On September 22, 1909, after the completion of the speed trials, opportunity was given to all the medical officers of the first squadron who could be temporarily spared to transfer to the *Pennsylvania* for a visit to the leper settlement on Molokai.

As it was necessary to have at least 1 medical officer on each of the other ships, 10 members of the corps availed themselves of the opportunity thus afforded, and landed at the settlement from the *Pennsylvania* on the morning of the 23d.

Prior to the visit a landing permit for each of the officers had been obtained from the president of the Territorial board of health, who at the time of the landing had arranged for the reception of the visitors. Permits to investigate the Molokai settlement are rather rarely issued and in this case were given for the purpose of "scientific investigation."

There is a good boat landing, and as the two boats from the *Pennsylvania* arrived the officers were received by the superintendent (J. D. McVeigh) and the physician and surgeon in chief (W. J. Goodhue), the band of the lepers playing the national air. The party then proceeded to the residence of the superintendent, where ponies and carriages were in waiting.

The settlement (established Jan. 6, 1866) is on a tongue of land of about 6,340 acres that juts into the sea, which surrounds the three sides. In the rear are perpendicular cliffs from 2,000 to 4,000 feet in height, forming a natural barrier to exit in that direction. The scenery is very impressive, and the location wonderfully well adapted to the purpose for which it is used.

There are two villages—Kalaupapa and Kalawao. The former, near the landing and to the westward of the reservation, contains the Bishop Home for girls, the Bay View Home for the feeble and helpless, a general hospital (not quite completed), a dispensary (with operating rooms attached), residence house for Sisters of St. Francis, superintendent's residence, physician's home, a church of Latter-Day Saints, a considerable number of cottages (old and new), *poi* factory and steam laundry, band stand, store, storehouses, a visitors' house (near landing), and other buildings necessary in settlements.

At Kalawao are the Baldwin Home for men and boys (a village in itself), Father Damien's Catholic church (which he constructed in part by his own labor and near which he is buried), residence of the Brothers of the Sacred Heart, and a Protestant church.

Beyond Kalawao and near the extreme eastern end of the reservation is situated the leper investigation station of the Public Health and Marine-Hospital Service. That station, in the midst of striking scenery and about 3 miles from the landing, is not quite completed. It will probably be in operation by the first of next year (1910) and is now receiving the special apparatus and general equipment necessary for as complete an investigation of leprosy by modern methods as is possible. There are 15 beds for cases to be selected from the settlement near at hand, a well-equipped laboratory, animal cages in connection with inoculation experiments, dark room for photographic development, ice plant, dynamo, and a gas generating plant. The buildings are of more or less temporary construction and planned to be employed as in the treatment and investigation of a contagious disease, arrangements being made for investigators and attendants to change clothing and take general baths in solution of bichloride of mercury, portions of the main building to be regarded as infected and others as uninfected.

Much is expected from the investigation to be carried on at that station and also in connection with the Kaliki receiving station at Honolulu to which all recently discovered cases are transferred pending removal to Molokai.

Since Hansen discovered the *bacillus leprae* (1874) little additional advance has been made in the study of this most ancient of known diseases, and to-day its mode of conveyance is nearly as much a mystery as ever. At any rate, much difference of opinion may still be found in that and other directions in relation to a disease which has a remarkable likeness to tuberculosis in certain particulars and to syphilis in others, as in its stages of development.

Yet leprosy, while still claiming victims in very many parts of the world and in some quarters in large numbers, is regarded as in general a slowly vanishing infectious disease of lessening severity. That opinion is entertained even at Molokai, where there are about 800 lepers showing the disease in all forms and degrees of severity.

The investigation station of the Marine-Hospital Service was visited by the party first, then Kalawao, and finally Kalaupapa.

At Kalawao about 100 male lepers are given accommodations in the Baldwin Home, or about 20 per cent of all the diseased males in the settlement. That home or institution is under the immediate management of Mr. Joseph Dutton, who has been rendering voluntary service to the Molokai lepers for 23 years. He was there during the latter part of the time of Father Damien, but has remained free from the disease.

The visiting party remained at the Baldwin Home for some time, examining the cases of leprosy present in such profusion. Among them were some cases of leprous blindness. Leprous affections of the visual apparatus are common and interesting. Even a simple conjunctivitis is more common and much more severe among lepers in view of the anæsthesia causing the eyelids to fail to appreciate the presence of irritating substances, thus abolishing the reflex action through which the conjunctiva would otherwise be bathed with the tears. However, leprous tubercles form in the choroid in a number of cases, thus producing a true leprous ophthalmia. The anæsthetic condition of the ocular conjunctivæ also predisposes to the formation of corneal ulcers. The blindness of lepers is chiefly due to corneal opacities. Leprous iritis, retinitis, and optic neuritis seem to be infrequent, but leprous ulcerations frequently result in ectropion, of which a number of cases were in evidence.

In not a few cases there was entire absorption of the cartilages and bones of the nose, giving the appearance not uncommon in late syphilis. It is on the nasal septum that the initial lesion of leprosy is said to be commonly found in the form of ulceration, and perforation is very common. It is in the nasal secretions that the bacilli of leprosy are very generally first discovered. Leprous rhinitis, associated with nose bleeding, is well known. Leprous tubercles form in nasal cavity, tonsils, pharynx, and in larynx. Ulcerations often penetrate the soft palate and form in other localities from disintegration of tubercular tissue.

The mutilations of leprosy are well known, and necrosed bone is responsible for sinuses and ulcers in many localities, especially, perhaps, on the feet, causing painful involvement of lymphatic glands. These cases of necrosis require operation and represent a considerable part of the surgical work done at Molokai.

A greater appreciation of the value of local treatment of ulcerations and of the removal of necrosed bone represents much of the advance made during recent years in the treatment of leprosy. Such treatment lessens the absorption of pus and septic material by the body and thus tends to improve the general health and increase the vital resistance. A certain amount of good is also thus derived from medicated baths. Eucalyptus is frequently used for this purpose. The leaves, thoroughly cut and mixed with those of the mountain apple and with ground hæmatoxylon bark, are tied in a muslin bag which is placed in boiling water for one hour. The decoction is then added to the bath water. Such baths lessen the number of febrile attacks common in lepers. A eucalyptus distillate was rather extensively used at Molakai in internal treatment but dependence is now chiefly placed upon chaulmoogra oil and strychnine. Very many other treatments have been tried and abandoned for one which has

been generally known and utilized for many years. The oil is given in small doses at first, 3 to 5 drops thrice daily, and gradually increased to perhaps 30 or more drops at a dose. The difficulty is from the tendency to cause stomach disturbance.

At the Bishop Home are about 80 female lepers in charge of the Sisters of St. Francis. There are perhaps 300 female lepers in the settlement, but most of them live outside of the Bishop and Bay View Homes. The Sisters have a school, and a very interesting musical entertainment was given us there. There were singing (solo and chorus) and piano playing of much merit. Such accomplishments lead to companionship and must be the source of much pleasure in the everyday life of the settlement.

There are marriages made by lepers and children are born, but the leper is not very fertile. The children are separated from the mother at birth, and are well cared for in a separate building as nonlepers. Few of them ever develop leprosy. The disease is not hereditary as a rule, if ever. Mothers are allowed to see their children, but not to come in contact with them, the visiting room being divided by a glass partition.

At the Molokai settlement there are also about 50 nonlepers, known as "Kokuas." They have been admitted to live in the settlement on account of their recognized interest in leprous husbands or wives. They live in intimate association with those in whom they are specially interested, tending and caring for them. It is worthy of note that there seems to be record of but one who has developed leprosy. Yet, it is the general opinion that leprosy is a contagious disease. The Hawaiian Islands were free from the disease until it was imported from the Orient. It is to-day known among the natives as the "Chinese sickness."

There is tendency at Molokai to believe that the disease is ordinarily extended by inoculation, the bacillus finding its way into the nonleprous body through some abrasion. It was suggested that such might well have been the method in the case of Father Damien, whose hands were frequently injured during his work in constructing buildings. Yet, the long history of leprosy is not free from a number of attempts to cause the disease by inoculation. Such attempts have very generally resulted in failure, and where success has been claimed the attendant circumstances have made the result inconclusive. Cultures, up to this time, have been made with great difficulty, or with more or less uncertainty. While the bacilli appear in large numbers in leprous nodules and in recent ulcers from breaking down of such tubercles, they are found with much difficulty in the pus of ulcers due to the breaking down of poorly nourished tissues.

Experiments at Molokai tend strongly to show that mosquitoes and bedbugs are not carriers. The bacilli were found on ants that

had crawled over soiled dressings and the same would be undoubtedly true of flies. In connection with the question of inoculation there is interest in the observation that the initial lesion appears to be on the nasal septum in perhaps 60 per cent of cases. In syphilis the initial lesion is always at the site of inoculation.

Leprosy is usually a chronic disease that in a number of cases does not run a progressive course. Persons were seen at Molokai who now present little or no evidence of the disease. This natural tendency to arrested development in some cases has been long noticed in leprosy and by many has been regarded as responsible for unwarranted claims of discovery of curative remedies.

It is a disease that permits many of its victims to live in the open air, to engage in work, and to find pleasure in sports and amusements in general. The situation of the settlement on Molokai is very favorable to such life. The climate permits all the waking hours to be passed in the open and allows the buildings to be so constructed as to give the largest measure of fresh air. The trade wind sweeps the entire locality and dissipates the odor that would otherwise dominate. Considerable work has been done by lepers in the construction of new buildings of better design than the old, but the demand is for money to obtain material for more extensive improvement along that line. There are two bands and a good bandstand, an athletic club, baseball team, shooting club, chess tournaments, dancing clubs, and moving picture shows. Races are run on a regular track and there is a number of good ponies. It is the aim to keep the inmates engaged in work and amusements—to obliterate any feeling of social ostracism and to diminish or gradually abolish the distress incident to separation from families. And in intimate relation to this design is the very good and important work of the Mother Superior and Sisters of the Order of St. Francis as well as that of the clergy and Brothers. A leper settlement has its moral questions as well as any other community.

The mortality at Molokai seems to be about 9 per cent. The cases are chiefly among Hawaiians, being about 87 per cent. The Chinese and Portuguese furnish most of the remainder. There are eight or nine Americans. The birth rate is perhaps 1.6 per cent.

There is in the Territory of Hawaii, as in a number of other localities, an opinion which finds expression from time to time that all lepers do not become known. In April, 1909, the legislature of the Territory framed an act providing for the care and medical treatment of persons afflicted with leprosy. By that act it is provided that every person who knows, or has reason to believe, that he, or any other person not already under the care or control of the board of health, is a leper, shall forthwith report to the board that fact. Any physician or police or other officer violating that provision is liable to a fine of not more

than $100 and to forfeiture of his license to practice, or to removal from office. A person reported to be a leper is examined by a physician or by physicians agreed upon by him and the board. Should the person be considered a leper by such physician or physicians, or a majority of them, he is transferred to a special hospital (Kaliki Receiving Station, Honolulu) where he usually remains under observation and treatment for six months and is then removed to Molokai. However, a leper whose custody it has been necessary to obtain by arrest or who is unwilling to submit to prescribed rules and regulations, may be removed to Molokai at once.

It seems to be the belief that the present law will add to the number of known lepers, but there are those who consider that local influences are too strong to permit a satisfactory territorial management of this question. Such persons advocate control by the General Government. In the abolition of leprosy the first requisite is knowledge of each and every case.

REPORT ON THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, 1910.

Surg. Charles N. Fiske, United States Navy, was the official delegate from the Naval Medical Corps in attendance upon the thirty-eighth annual meeting of the American Public Health Association at Milwaukee, Wis. After an introductory paragraph Surg. Fiske makes the following report upon this meeting:

In addition to the papers and discussions heard at all general meetings, I succeeded in hearing most of the papers presented by members of the laboratory section, which it seemed most desirable that I should join. Meetings of the section on vital statistics and municipal health officers' sections being held at the same time as the laboratory section, I could not attend.

Two new sections were formed and designated as "Section on sociology" and "Section on sanitary engineering."

The executive committee was authorized to appoint a committee on printing, which, in connection with the committee on publications, should publish a monthly journal to contain the proceedings and papers of the association. The executive committee was also empowered to appoint a committee to cooperate with the executive committee of the International Congress on Hygiene and Demography (Washington, 1912) to seek from Congress authority and appropriation for representation and exhibits at the International Hygiene Exhibition at Dresden, Germany, for 1911.

I had the honor to address the special section authorized to consider the subject of this country's representation at Dresden, and by

request read an appeal to the association written by Medical Inspector H. G. Beyer, United States Navy, who was unable to be present.

Your delegate, being a member of the committee on education of the public as to communicability and prevention of gonorrhea and syphilis, read a paper before the general association entitled "A Consideration of Venereal Prophylaxis in the United States Navy for the Benefit of Public Health Officials." A copy of this paper had already been filed in the Bureau of Medicine and Surgery. The following is an abstract:

"About 50 per cent of the enlisted personnel of the Navy have a venereal disease during an average service of four years. During 1908 there were 4,681 original venereal infections, which entailed a loss of service and expense for treatment of 106,526 sick days; there were 1,001 cases of syphilis, which represented nearly 7 per cent of the total physical disability of the Navy for that year.

"While the morale has steadily and vastly improved during the past ten years, in other respects the damage resulting from this class of affection had assumed such proportions four years ago that numerous medical officers no longer felt justified in waiting indefinitely for moral regeneration; they felt that military efficiency demanded activities promising more immediate results; they instituted personal prophylaxis by use of antiseptic irrigations and inunctions following exposure and upon return to ship or station. Certain results achieved caused the department nearly two years ago to authorize extension of this work in connection with the customary educational propaganda and distribution of confidential circulars throughout the service.

"Sailors and marines do not contract venereal disease from the Navy, but from civil communities, which are as notoriously indifferent to venereal disease as they were formerly to typhoid and other widespread infections. Military services have practiced compulsory notification of venereal disease for years and expect civil authorities to take similar measures for control. The source of the Navy's 15,000 first-enlistment recruits and the destination of a similar number of men discharged each year is the civil population. Its statistics would indicate that one youth out of every six in our urban population between the ages of 17 and 24 contracts a venereal disease each year.

"Venereal disease has by no means yet been conquered in the Navy, but there is evidence that its ravages are being materially lessened, and that instead of encouraging vice through the hope of immunity the margin of failure of this prophylaxis is sufficiently wide to deter an increasing proportion of the personnel from sexual indulgence; the desire for clean men and clean ships has been stimulated and no sense of security has been engendered."

The recommendations of the above-named committee were approved with slight modifications by the executive committee and were adopted by the association, as follows:

1. The recommendation, study, and control of the prevalence of these, as with all other communicable preventable diseases, in order to ascertain their distribution.

2. An educational campaign for parents of all social classes and children of all ages and sexes. This teaching should be not only moral but also medical in the widest sense.

(*a*) Proper distribution of circulars, pamphlets, and other literature by State health departments through all suitable channels.

(*b*) State health departments to instruct all of their local health officers in sexual matters, and direct them to make a systematic effort to educate the people in their respective communities.

(*c*) State health departments to make a definite and determined effort to awaken and interest the medical profession in this fight against venereal diseases.

(*d*) State health departments to send out specially trained paid teachers and lecturers of their own, supported by exhibits and lantern slides, to address special meetings of parents, health officers, medical men, teachers, and others in schools, colleges, churches, etc., on these and other preventable diseases.

(*e*) State health departments to encourage the organization of local leagues or associations whose purpose shall be the support of and control of a crusade against the spread of all communicable diseases. Said societies to include every profession and walk of life; to depend on philanthropists for necessary funds, rather than on paid subscriptions for fundamental support.

(*f*) Health departments to interest and provide for the authorities having charge of the educational curriculum in public and private schools. (1) By introduction of biology into the graded courses of all schools; (2) to provide instruction in sexual matters for students of the upper grades; (3) by special instruction to normal school students who are to become the instructors. To impress on presidents, deans, preceptors, and teachers the necessity of exercising their influence on students in reference to the communicability of syphilis and gonorrhea, and to inculcate a morale of protection among the college fraternities.

(*g*) To utilize the public press for the proper occasional presentation of the subject, and to discourage the display of advertising matter which encourages the exposure to dangers in these diseases.

(*h*) To utilize church clubs, fraternal societies, trade unions, women's clubs, and especially mothers' clubs for instruction of parents.

(*i*) Health departments to recommend the enactment of laws for: (1) Physical inspection and segregation of prostitutes. (2) Notification and report (by number, if desired) of venereal cases. (3) Physical examination of men before marriage, male applicants for marriage license in order to obtain it being required to submit to an examination by a duly qualified physician for the purpose of ascertaining whether said applicants are free from venereal diseases. (4) To make it a crime to spread any venereal disease. (5) By keeping open free night dispensaries and maintenance of special dispensaries and hospitals for these diseases.

(*j*) Advocacy of temperance on account of the relationship between alcoholism and venereal diseases.

(*k*) Advocacy of personal cleanliness and venereal prophylaxis. Advocacy of early marriages.

Although, in accordance with bureau's instructions, I undertook to learn everything possible which was being done in connection with epidemic polio-myelitis, and two informal meetings were held by

those specially interested, nothing really new was advanced; it was apparent, however, that members of State and municipal boards of health have been doing an enormous amount of work, but up to the present time the results are too conflicting as to epidemiology and negative as to etiology to justify the quoting prematurely of impressions offered by the several members participating in these informal discussions. The advisability of enacting laws and ordinances to require the reporting of all cases of infantile paralysis was agreed to unanimously. Quarantine of cases for two weeks and exclusion from schools and observation of contacts for a similar period was generally urged. The disinfection of excreta was also recommended.

I transmit herewith a copy of the program, as well as copies of all (eight) abstracts obtainable. Pamphlets and circulars are also appended, entitled:

"The Milwaukee Destructor" (visited by the association), "Sex Hygiene," Circulars 1, 2, and 3, and "Ophthalmia Neonatorum," of Rhode Island State Board of Health.

The meeting was well attended, the papers were of absorbing interest, and the discussions entered into, so far as the limited time would permit, with much enthusiasm.

The association with such active, scientifically methodical and unselfish workers as are found in the laboratory section should be an inspiration to any one privileged to attend.

The full papers will be received by the bureau at intervals as soon as published in the proceedings of the association.

REPORT ON THE MEETING OF THE AMERICAN HOSPITAL ASSOCIATION, 1910.

The Naval Medical Corps was represented by Surg. A. W. Dunbar, United States Navy, at the annual conference of the American Hospital Association at St. Louis, Mo., September 20 to 23, 1910.

He submits the following report upon the transactions of this conference:

While some of the subjects discussed were not those in which medical officers of the service are directly concerned, all were interesting, and many, particularly those upon modern hospital construction and economic hospital administration, extremely so. In this connection, I wish to express my appreciation of the official and social courtesies extended to me as a representative of the Medical Department of the Navy.

The president, Dr. H. B. Howard, superintendent of the Peter Bent Brigham Hospital of Boston, Mass., in his opening address dealt with the relations of the superintendent with the heads of departments, the general management of hospitals, and laid stress upon a more thorough screening of wards than is usual.

Dr. S. S. Goldwater, of Mount Sinai Hospital, described "A plan for the construction of ward buildings in crowded cities," in which he advocated a T plan for the wards, the stem representing a 26-bed ward; the top, the service, and four quiet rooms. A balcony is placed at each side of the stem on the parts corresponding to the under side of the top of the letter. The orientation should be such as to give a southern exposure to the free end of the ward. Goldwater claims that this arrangement insures a maximum exposure to the sun and a favorable location for the balconies as regards sunshine. The two balconies allow separation of the convalescents from those acutely ill, while both and also the ward are under easy observation by the nurse in the centrally located pantry and utility rooms. The quiet rooms, linen closet, toilet and lavatory rooms, the elevator, and stairway are located in the transverse part, separated by a corridor from the other ward service rooms. The plan, it is stated, conduces to ease of administration and is capable of having additional stories added without detriment to its sanitary or architectural features. One point appears susceptible of criticism, viz, the location of a lavatory and a closet at what would be the south end of the ward, which could better be utilized for ward space, placing the rooms referred to at the sunless end of the ward.

In another paper Goldwater describes an "Elastic ward unit in the construction of hospitals for contagious diseases." The purpose of this plan is to allow of the expansion of any one unit at the expense of another, when the number of any one type of infectious disease is in excess, thus obviating an unnecessarily large plant. The patients are given separate rooms arranged along one side of a corridor which has partitions with doors corresponding to each room. At each end of this line of rooms is an annex joining at a right angle containing the service, nurses,' detention, and discharging rooms, with a nurse's station in the angle. The rooms are assigned to a certain type of contagious disease, commencing at the ends, the rooms inside of this being hermetically sealed off by the corridor doors. Thus it can be seen that one room may be occupied by a case of smallpox, while the remaining space is utilized for scarlet fever.

While this elasticity obviates the necessity of providing units adequate in size to accommodate the maximum requirements of any one type, yet the initial expense involved in the large extent of interior walls and of partitions, the large size of the ward service rooms which must be adequate to supply all rooms but one if required, offsets this advantage. Individual rooms are undoubtedly desirable, but at the same time increase the difficulty in administration, requiring more attendants.

Under the title of "Hospital construction in St. Louis," Dr. Wayne Smith, superintendent of the University Hospital of that

city, gave a description of the 400-bed "Robert A. Barnes Hospital" to be erected under a large endowment. The ward buildings, four stories in height, are arranged along one side of a long corridor. The wards have a capacity of 30 beds, each having a porch on the free or southern end, the service rooms, laboratory, and dressing rooms adjoining the corridor, on the other side of which are the quiet rooms.

The administration building occupies a central location on the south side of the common corridor, opposite which, in the rear, is the casualty ward and the subsistence building. The elevators and stairs are in small annexes between each two wards. An unusual feature is the utilization of the fifth floor of the corridor for private rooms. The corridor, which below is 15 feet in width, is here widened by being extended on each side by trusses. A corridor occupies the entire north side, the rooms being placed along the south side.

Clarence W. Williams, Esq., of Boston, Mass., read a paper on "Modern practice in hospital heating and ventilation." The system described by him is essentially that adopted for all our modern naval hospitals, a hot-water heating plant with forced circulation and the exhaust and supply ventilation systems with heating of the supply in cold weather.

In connection with the latter the necessity of having the tempering coils supplied with steam instead of hot water was emphasized. In an incident mentioned an entire plant had to be closed down, owing to the freezing of the circulating water in zero weather by the rapid passage of the air through the stack.

From the papers read, the discussions thereon, and from observations of the hospitals visited, the following opinions were formed as to the prevailing tendencies in hospital construction:

Wards.—These should preferably be not more than two stories in height. The capacity should not exceed 26 beds. The sun porches, or solaria, should be ample as to size and easily accessible, but should not be placed so as to shade or interfere with the ventilation of the wards. The tendency is to make the entire ward a solarium. The health department in Chicago requires two windows to each bed.

Floors.—This subject is one upon which the greatest variety of opinion is expressed, but the majority appear to be in favor of a well-laid floor of yellow Georgia pine filled and polished with the usual wax paraffin, turpentine, and varnish mixture.

In regard to strips of material to deaden sounds in the corridors or wards, rubber, compressed cork, linoleum, and building paper filled, varnished, and polished were mentioned. Linoleum seems to be the most satisfactory.

Walls.—Opinion here is divided as to the most satisfactory color, some advocating light blue or green, others a light yellow.

Lighting.—There seems to be no satisfactory method of ward illumination. Lighting from inverted reflectors throwing the light on the ceiling has been found unsatisfactory in some hospitals, the illumination being insufficient for bedside work. The use of holophane reflectors throwing the light down on the bed, but permitting only a minimum amount to strike the eyes of the patient on the opposite side, as suggested by Passed Asst. Surg. H. W. Smith, United States Navy, appears to be the most rational method.

Nurses' call system.—The silent call by electric lights has given complete satisfaction. Its working, as well as a similar call for the medical officers, was seen at the Michael Reese Hospital in Chicago. As there installed, it is faulty in that the call and resetting button are combined in one, a second push resetting, so that the patient may in his impatience push the button a second time, thus canceling the call.

Ventilation.—Many superintendents refer disparagingly to the forced supply as too complicated, being liable to frequent breakdowns, and also on account of the large amount of dirt introduced into the ward despite filters and water air-washers. This latter objection does not apply to naval hospitals, which as a rule are not located in places where the air is as liable to be as dusty as in the cities. Furthermore, as a certain amount of fresh air is required for a patient and must be introduced from the outside, it would appear that it were better to receive it partly filtered than not at all so.

Automatic heat regulators.—Contrary to expectations, the reports on the electric thermostats were favorable, but it is admitted they require intelligent supervision.

Stairs.—The use of inclined planes instead of stairs is advocated, but not as a substitute for elevators, as claimed by some. The principal advantage appears to be that patients on crutches or with injuries involving the lower extremities can use them more readily than the stairs.

Operating rooms.—A tendency to greater simplicity in the wall material of operating rooms is apparent, enameled hard finish replacing marble and tiles. The glaring white walls are being replaced by light yellow or "robin's egg" blue, which are claimed give a more satisfactory light.

From observation it would appear that the omission of tile wainscots in operating rooms and corridors has not been advisable, as the hard finish shows numerous abrasions from stretchers and tables, etc.

Kitchens.—Some argument was made for the location of all kitchens on the top floor to prevent odors from permeating the hospital. Against this is urged the fact that the kitchen thus occupies a most desirable location for the operating department, while the space in the basement vacated by it is of little use for other purposes. With

proper hoods over the range and an exhaust fan, and especially with the culinary department in a special detached building, as in our naval hospitals, the basement appears to be the best location.

Nitrous oxide and oxygen anæsthesia.—This method of producing anæsthesia is in constant use in the Michael Reese Hospital, with a simple apparatus constructed by Dr. Hornsby, the superintendent, who states that anæsthesia has been continued as long as three and one-half hours in a difficult operative case. No serious sequelæ have been noticed and this method has to a large extent supplanted ether.

Among the commercial exhibits was an automatic steam-supply regulator for sterilizers which is set for a lower pressure than the safety valves. When the steam in the chamber of the sterilizer approaches that at which the steam will blow off into the room, the high-pressure supply is automatically diminished, thus avoiding the escape of steam into the room and the subsequent condensation.

A porcelain "bubbling spring" drinking fountain was exhibited by the Clow Co., which has been introduced into public schools and appears to be suitable for use in hospitals where the insanitary features of the common drinking utensil are accentuated.

In conclusion it is evident that the recently reconstructed naval hospitals and those now building combine the most advanced ideas in hospital construction.

In regard to administration, particularly as far as relates to economic housekeeping, it would appear as if the naval medical service can well consider the papers and discussions of the superintendents of civil hospitals. While averse to making any suggestions tending to an increase in the clerical work of the naval hospital, it would seem desirable to introduce a simple system of cost accounting at our hospitals which would allow the medical officer in command to determine excessive expenditure at any time. There is at present, if I am not mistaken, no common system of cost accounting in our hospitals other than the annual reports. The comparison of the per capita per diem expense of the various hospitals alone is insufficient to establish the efficiency of administration, including as it does the salaries of civilian employees and other constant expenses which continue irrespective of varying numbers of patients, thus decreasing the daily maintenance in the larger hospitals to the apparent disadvantage of the smaller institutions. The number of surgical cases, especially operative cases, has a distinct bearing on the cost of maintenance. The subsistence of patients in naval hospitals is susceptible of either reduction in cost or improvement in quality with no increase of cost by the services of a skilled dietitian, as is done in some civil hospitals.

THE LATEST WORD FROM EHRLICH.

The increasing mass of literature which is coming to us daily from the many observers using "606" causes the appended copy of a letter from Ehrlich, recently received by a New York physician, to have a peculiar value at this time because of its authoritative source.

A copy of the letter was obtained from Dr. J. C. Bierwirth, of Brooklyn, through the courtesy of the Surgeon-General of the United States Army, after the January, 1911, issue of the Bulletin had gone to press.

So instructive and magisterial are Ehrlich's words that it has been deemed advisable to publish in full the text of this recent letter and to insert it into the already printed Bulletin for the knowledge and guidance of those who purpose to employ "606" as a curative medicament in syphilis.

The letter reads as follows:

FRANKFORT, *October 25, 1910.*

DEAR DOCTOR: By dispensing nearly 40,000 flasks of the No. 606 preparation, I have provided a large number of colleagues with an opportunity to gather extensive experience concerning the efficiency of this remedy. The results of this treatment, as you will know from personal observation as well as through the publications in medical papers and the *Koenigsberg* reports, have been generally favorable, in part excellent, so that one is justified in asserting that the therapeutic value of the remedy has been positively established.

The indications and contraindications have also been determined. It has been found that dangers to the eye do not exist, and that with the exception of optic nerve atrophy, the preparation can be employed in the typical syphilitic affections of the eye, notably in gummatous iritis. A contraindication is known to be represented by *severe* affections of the nervous system; also diseases of the heart and blood vessels.

The first phase of testing No. 606 I am accordingly justified in regarding as concluded. Now begins the second period, which concerns the *permanent action* of the remedy. It goes without saying that the permanent action must depend upon a series of factors, namely:

1. The size of the dose and its mode of application.
2. On the type of the disease.

In a general way the guaranty of a permanent success may be said to increase with the original force of the therapeutic effect, which is naturally strengthened by the size of the dose and the rapidity of the absorption.

From this point of view the most efficient would seem to be:

1. *Intravenous* injection of an alkaline, much diluted solution.
2. *Intramuscular* injection of the alkaline solution. Next in order follow:
3. The very irritative acid solutions (mono- and dichlor-hydrate).
4. Lastly, the so-called neutral emulsions (intramuscularly, subcutaneously).

In the interest of the subject I deemed it right, in the first place, to leave each individual investigator as much liberty as possible in the selection of the method, as it was only in this way that one could hope to expect a review concerning the relative value of the individual modes of injection by comparing the accomplished results.

It has already been shown that the method which has probably been most extensively used, namely, the *subcutaneous* introduction of the *neutral emulsion*, is less competent in regard to the permanency of the effect than the other methods. This

may be referable to the intrinsic difficulty of preparing the emulsions in absolute uniformity and delicacy. Under these conditions, the absorption of the remedy must be extremely variable, and it would seem to be especially unfavorable precisely in the case of subcutaneous application. At least, this is suggested by the manifold complaints concerning persistent infiltrations, softening and necrosis. The extensive distribution and application of the emulsion is due to the fact that this injection, in contradistinction to the alkaline and acid solutions, gives rise to no considerable pain, in the first place, and that the immediate result, moreover, was usually entirely satisfactory in the healing of the lesions. Presumably this is accounted for by the absorption of relatively small amounts of the remedy exerting a satisfactory curative effect, in view of the eminent efficiency of the preparation, so that the results at first leave nothing to be desired. But according to the news that I receive it appears that the therapeutic effect in this method lacks the sufficient energy to obtain generally a destruction of the spirochetes, equal to sterilization.

In this respect, the *intravenous* injection evidently yields a better result of the treatment. The intravenous itself is very simple, as well as devoid of danger under proper selection of the cases, and much pleasanter for the patient. Altogether over 1,000 cases have already been treated, namely, over 500 by Schreiber, in Magdeburg; over 200 by Weintraud, in Wiesbaden; 200 by Iversen, in St. Petersburg; also numerous cases by Neisser (Breslau), Werther (Dresden), Gennerich (Kiel), Treufel (Frankfort), Broden (Leopoldville), Bitter (Cairo), and Hausmann (Tula). Concerning the technic the reader is referred to the inclosure.

As to the intravenous dose, at least 0.3 [grams], but usually 0.4 to 0.5, is injected by Alt and Schreiber, while Weintraud and others, in a given case, employ still larger doses up to 0.7 to 0.8

Iversen, moreover, administers two or three days after the intravenous injection (average dose 0.5) the intramuscular deposit (0.3 to 0.5), so that the total quantity amounts to about 0.8 to 1.0

It is extremely important that the intravenous injection can be repeated after two or three weeks, and this repetition is advisable when the curative effect of the first injection is not entirely complete—for example, when the lesions have failed to undergo a complete retrogression or when a positive Wasserman reaction is still present at the end of four weeks. In these cases the repeated injection is to serve as a "snapshot" (hit or miss), according to an expression used by Alt.

Signs of overirritability, such as I had feared at first, have not as yet appeared, although in certain localities the intravenous injection has been repeated two or three times, or even four and five times in isolated instances. According to all I learn, the method of intravenous injection seems to deserve the preference, in regard to permanent action, above the previously predominating modes of application, especially the subcutaneous method. Although I appreciate that there are certain technical difficulties in the way of the introduction into general practice of this procedure, still the selection of the most efficient mode of treatment is conclusive, in the interest of the patient. It is therefore recommended that this method be introduced for the present, at least in hospitals and clinics.

The following features I wish to point out more particularly:

1. Primary lesions should be submitted to treatment as rapidly and timely as possible, and they should be injected with at least 0.5 gram intravenously, if the patient is a robust youthful individual, as is usually the case. Aside from this, it would seem to be advisable, in the interests of actual sterilization, to make use of an energetic local treatment—extirpation, cauterization, or other tried and tested methods.

2. In affections of the central nervous system and the circulatory apparatus, when these are at all adapted to the treatment, great caution is indicated and should be expressed in the application of small doses (0.2 to 0.4). Whether in these cases also the intravenous injection is entitled to the preference above the former modes of application can not be stated at the present time.

You will greatly oblige me by lending me your support, as heretofore, also in this direction and by adopting in the future as far as possible the method of intravenous injection.

With best regards, etc.,

Yours, very sincerely, P. EHRLICH.

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NO. 2 VOL. 5

UNITED STATES NAVAL MEDICAL BULLETIN

FOR THE

INFORMATION OF THE MEDICAL DEPARTMENT OF THE SERVICE

LIMITED TO PROFESSIONAL MATTERS AS OBSERVED BY MEDICAL OFFICERS AT STATIONS AND ON BOARD SHIPS IN EVERY PART OF THE WORLD, AND PERTAINING TO THE PHYSICAL WELFARE OF THE NAVAL PERSONNEL

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TRUMAN H. NEWBERRY,
Acting Secretary.

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PREFACE.

The publication and issue of a quarterly bulletin by the Bureau of Medicine and Surgery contemplates the timely distribution of such information as is deemed of value to the medical officers and the hospital corps in the performance of their duties, and with the ultimate object that both shall continue to advance in proficiency in respect to all of their responsibilities.

It is proposed that the Naval Medical Bulletin shall embody matters relating to hygiene, tropical and preventive medicine, pathology, laboratory suggestions, chemistry and pharmacy, advanced therapeutics, surgery, medical department organization for battle, and all other matters of more or less professional interest and importance under the conditions peculiar to the service and pertaining to the physical welfare of the naval personnel.

It is believed that the corps as a whole should profit, to the good of the service, out of the experience and observations of the individual. There are many excellent special reports and notes beyond the scope of my annual report being sent in from stations and ships, and by communicating the information they contain (either in their entirety or in part, as extracts) throughout the service, not only will they be employed to some purposes as merited, but all medical officers will thus be brought into closer professional intercourse and be offered a means to keep abreast of the times.

Special attention will be given by the instructors of the Naval Medical School to the review of advances in medical science of special professional interest to the service, as published in foreign and home journals, and extracts from these will appear in the bulletin, together with such remarks as the instructors may deem of value to officers on foreign service or sea duty.

Information received from all sources will be used, and the bureau extends an invitation to medical officers to prepare and forward, with a view to publication, matter on subjects relating to the profession in any of its allied branches.

C. F. Stokes,
Surgeon General, United States Navy.

SPECIAL ARTICLES.

THE INTRAVENOUS ADMINISTRATION OF "606" in 56 CASES.

[Preliminary report from the United States Naval Hospital, Norfolk, Va.]

Passed Asst. Surgs. GEORGE B. TRIBLE and HARRY A. GARRISON, United States Navy.

In the report of the Surgeon General of the Navy for the year 1910 the number of cases of syphilis is given as 2,436, with 49,647 sick days, or 39.6 per cent damage in terms of percentage of sick.

These patients are usually the most typical cases with definite symptoms and histories, are nearly all in the primary and secondary stages, and have been subjected to vigorous treatment.

The later manifestations of syphilis are not seen so frequently, owing to the fact that the current term of enlistment has expired, and the men have returned to civil life, or the later manifestations may be classed under other diagnoses. Perhaps many of the cases of so-called chancroid are syphilitic as well as many of the cases grouped as adenitis.

In addition to these are the cases which are concealed from the medical officer, the cases existing prior to enlistment, and the cases contracted after enlistment for which the men receive clandestine treatment. It is extremely probable, in our opinion, that the number of cases in the service, if all were discovered and subjected to treatment, would be 25 if not 50 per cent greater than the figures known at the present time. For the reasons mentioned above it is readily understood that the late syphilitic and the parasyphilitic conditions, such as tabes dorsalis, general paresis, etc., are not commonly seen in the service.

The usual methods of treatment hitherto in vogue have been the "1,2.3 mixture," the protoiodide granules, inunctions, and, in hospitals, the intramuscular injections of the bichloride, the salicylate, or some of the insoluble preparations. The above methods have usually been combined with the administration of potassium iodide in increasing doses. The difficulty of continuing treatment when frequent transfers are made from ship to ship, or to and from receiving stations, and the restrictions upon the liberty of venereal patients imposed by the regulations, have all tended to put a premium upon the concealment of venereal diseases, neglect of treatment, or the use of secret nos-

trums. This unfortunate state of affairs will be remedied to a great extent by the recently introduced health records, which the men carry with them throughout their enlistment.

The importance to the service and to the Nation at large of having some preparation, drug, or chemical, that would really be a certain, rapid, and beyond a reasonable doubt, an efficacious remedy, is easily seen. Failing that, the selection of a remedy that would make it possible to decrease the number of sick days to a minimum, to heal rapidly the active lesions and the so-called "open lesions"; that would take the patients off the restricted list and tend to promote satisfaction and make concealment of their disease no advantage; a remedy furthermore that would not be dangerous or be followed by disastrous sequelæ, is certainly "a consummation devoutly to be wished." With this end in view the use of salvarsan was adopted as soon as it could be secured in the market.

It is to be noted that all the cases embraced in this preliminary report were selected cases. There was no doubt of the diagnosis clinically, nearly all showing open lesions, some few being extremely resistant to mercurial treatment. Thorough physical examination was made of each case, the urine analyzed, eye ground examined, and visual field taken. All cases but two or three admitted infection, and it is interesting to note that in one case, having a chancre of the lip, the disease was most probably innocently acquired.

To understand what is to be expected of this treatment, it is necessary to go into the history of "606," or salvarsan, and some of its congeners and forerunners, and to get the idea of Ehrlich's theory of chemotherapy. For several years Ehrlich and his assistants have been pursuing researches with an idea of discovering chemicals with a specific action upon the various infectious agents, chemicals which are parasito-tropic in their action. The first work of note was done with the dyestuffs, such as trypan red; later work was done with atoxyl, which was discovered by Bechamp. The action of this remedy was remarkable, but owing to 1 to 2 per cent of blindness due to primary optic atrophy, following its use, it has been practically abandoned.

Arsacetin, chemically, sodium-acetyl-phenyl-arsenate, was later in vogue and is a preparation of great merit, being only one-tenth as dangerous as atoxyl. Prior to all these the use of the arsenical sodium cacodylate in syphilis and in the obscure rheumatic pains, probably of syphilitic origin, is well known. The administration of Fowler's and Donovan's solutions in the intervals between mercurialization has long been the custom, though the latter solution itself contains mercury. Arsacetin, the direct forerunner of salvarsan, was given by Neisser in doses of 0.5 gram by injection, in a 10 per cent solution,

twice weekly until 12 grams had been given, combined in his cases with the use of the gray oil or calomel.

Salvarsan, or, as popularly termed, "606," was discovered or compounded by Bertheim, one of Ehrlich's assistants, and has the chemical formula $C_{12}H_{12}O_2N_2As_2$, and, according to the Lancet of October 8, 1910, has a graphic formula as follows:

$$\begin{matrix} OH \\ NH_2 \end{matrix} > C_6H_3-As=As-CH_3 < \begin{matrix} OH \\ NH_2 \end{matrix}$$

This preparation had been given experimentally to mice and rats infected with recurrent fever and to syphilized rabbits, by injection, causing a disappearance of the parasites and apparent recovery. In September, 1909, salvarsan was sent from Ehrlich's laboratory to Alt, who had previously used a similar preparation, arseno-phenyl-glycin, in syphilitic paralysis. Before the new preparation was given to patients it was tried on dogs and later on themselves by two physicians. The dosage given in the first cases was 0.3 gram and the method used was intramuscular injection, the site chosen was the area between the shoulders, or the buttock, and in some females under the mammæ. Investigations pursued by these experimenters, and later ones, showed that the arsenic appeared in the urine in 12 to 24 hours and continued to be excreted over a period of 10 or 12 days. Later investigators found that no arsenic appeared in the excretions after intravenous administration later than the third or fourth day.

The opinions and conclusions regarding the Wassermann reaction, after the administration of salvarsan, differ, some claiming that it becomes negative only in 10 per cent of the cases in which it was formerly positive, while Schreiber and Hoppe report that in 52 cases, followed for 50 days or more, 84.6 per cent were negative in 50 days, later others became negative, making a total of 92.3 per cent negative. The earliest reported negative was in 4 days, the latest in 70 days. It is the opinion of many investigators that the Wassermann reaction becomes later positive. Owing to lack of reagents the Wassermann was not carried out in these cases and for that reason the typical cases were chosen.

It is well to note briefly the physiological action of arsenic itself and its maximum dose and see if these actions are borne out in salvarsan, which is by weight one-third arsenic. Briefly, the most marked actions of arsenic are a relaxation of the walls of the capillaries, a fall of blood pressure, later a paralysis of the capillary walls, and as a consequence of this a gastroenteritis with watery stools. Among the later effects are fatty degenerations of cells, muscles, and glands. The red blood cells are increased and the hemoglobin content is higher. The skin reactions are of interest. Among the untoward effects are the erythemas, the so-called arsenic rashes. Possi-

bly there may be falling of the hair or detachment of the finger nails. There is an increased deposition of fat, which may be explained in this manner, viz: Arsenic increases the nitrogenous waste. The excess in fatty products of albuminous decomposition is not excreted; hence a production and deposition of fat. Tolerance to this drug is readily acquired. The inhabitants of Silesia are said to consume as much as 0.4 gram daily with no untoward effects. The excretion of arsenic occurs by the urine, feces, sweat, milk, and epithelium.

The writers have now made 56 administrations of salvarsan, all by the intravenous method. To us it hardly seems worth while to defend this method. There can be no doubt that the trypanosoma, or certainly the one causative of sleeping sickness, soon becomes resistant to arsenicals. This has been demonstrated in the case of atoxyl. Further, it is well known that any solution or suspension, with the exception of physiological saline solution injected intramuscularly, acts as a foreign body, producing irritation, walling off [encystment], and in most cases a new albuminous compound. This all tends to make absorption slow, and instances are known to the writers in which ptyalism has been produced many days after the injection of mercurials. A notable case of poisoning is reported by Keyes, that of a woman who was kicked down a stairway by her husband, the fall breaking adhesions and walling-off membranes around numerous masses of mercury which had been injected into the buttocks [thus liberating and suddenly forcing into the general circulation an overwhelming dose of unabsorbed mercury, as a result of rupture of cysts containing doses of mercury previously given intramuscularly].

Salvarsan is extremely irritant in the concentration in which it is usually introduced by intramuscular injection; necrosis of tissue has been reported; at any rate absorption must be relatively slow. It is self-evident that after intravenous administration it makes the circuit of the circulation as rapidly as the blood stream. If we accept the idea of Ehrlich, or a modification of it, the *therapia magna sterilisans*, in order to carry it out, it is logical that the greatest possible quantity of the medicament must be thrown into the organism at one time, directly into the blood stream, to reach the tissues.

The preference of luetic manifestations for the circulatory apparatus, as is evidenced by the luetic obliterative endarteritis, the occurrence of aneurysms in syphilitics, with treponema in the walls, is well known, and naturally leads to a therapy which would introduce the drug to the affected area.

The rapid excretion following intravenous administration is, in our opinion, an advantage, for the following reasons: The idea is to treat the parasite, not the individual. The medication is brought in direct contact with the parasite, its action whether as a parasiticide

or whether it forms some unknown chemical compound or reaction is completed, and excretion takes place.

There is no pain, while with the intramuscular injection the pain is intense. There are no large indurated, indolent areas which may go to suppuration or necrosis and which have been found to contain arsenic for weeks. There is dilution of the toxins by the salt solution and more rapid excretion.

The dangers commonly mentioned are air embolism, which can be readily avoided, but if it does occur it is of no consequence. Darier mentions that he has inadvertently injected a syringe full of air into a vein with no ill effects. The formation of a thrombus is extremely unlikely with complete asepsis and sterility of solutions. The "ampule" as received in the package is removed from the covering, cleansed with bichloride or carbolic solution, then with alcohol (the little file is treated likewise), and, seized with sterile gauze, the junction of the shoulder and neck filed, and by a quick bend is broken. The powder is poured into a 500-cubic-centimeter flask containing 40 cubic centimeters of 0.9 per cent solution of chemically-pure sodium chloride containing 30 to 40 solid glass beads about the size of BB shot. It is rapidly agitated until all has gone into solution, giving a clear, transparent, greenish-yellow fluid. Then drop by drop a 15 per cent solution of sodium hydrate is added, shaking after each drop. The addition of about 6 drops causes the solution to become cloudy, and only after a total of from 12 drops upward does it begin to clear. When it has become absolutely clear and is just alkaline in reaction to litmus paper, 260 cubic centimeters of 0.9 per cent chemically-pure sodium chloride solution are added, shaking continually. This makes a total of a little over 300 cubic centimeters of solution ready for administration. It may require anywhere from 12 to 30 drops of the 15 per cent sodium hydrate to render the solution alkaline. The writers know the importance of these simple directions by sad experience. About six tubes were rendered useless by following the directions given with the preparation and by the use of tablets used in preparing normal saline solution for hypodermoclysis, for these tablets contain other salts than sodium chloride. It is evident from the dilution and the content of the "ampule" (0.6 gram) that each 50 cubic centimeters now contains 0.1 gram of "606." Salvarsan should not be exposed to the light or handled in any way until everything is ready for its use, and we believe that the earlier the preparation is used after manufacture the better.

The apparatus, after boiling, is washed out with the same salt solution mentioned above, and always washed with this solution between the administrations when more doses than one are given, and kept at a temperature of 100° to 110° F. If these directions are not followed, a cloudy solution is certain to result. In our experience the solution

is quite unstable and tends to become flaky within one hour. We consider it imprudent, if not absolutely dangerous, to use solutions which are not clear for intravenous work, and those whose technique can not be brought to that point had best confine themselves to intramuscular injections. After the preparation the solution is filtered through white Swedish filter paper to remove any possible particles which may have broken from the beads or any fragments of the "ampule" which may have fallen into the solution. The vein being prepared, the canula with a shoulder is introduced, care being taken not to strip the *intima*. The solution is freely sprayed into the wound before entrance into the vein is effected, to clear out the blood, and no irritation has been noted. After entrance has been effected the ligature is tied behind the shoulder of the canula. Then the solution is allowed to run into the vein, first by the force of gravity, having a 2 to 3 foot elevation, later adding pressure by air pump. The rubber tubing leading from the reservoir is interrupted by glass tubing in three places, so that the condition of the solution can be watched. The presence of any particles visible to the naked eye causes us to check the flow immediately, remove the canula, and flush out the particles. This has not happened since the bottle and tubing have been thoroughly washed with salt solution before using. The dose administered has varied, usually being a little above 0.5 gram, the "ampule" contains 0.6 gram, but, allowing for waste, approximately 0.5 gram reaches the circulation. In a few cases, with complications such as albuminuria, choked disk, extreme age in one case, and extreme weakness in another, doses from 0.25 to 0.3 gram were given. In our opinion there is no danger in heart cases (of which we have treated several), so long as compensation has been maintained and the blood vessels are in fair condition. In these cases the solution must be given slowly, allowing time for the heart to accommodate itself to the increased volume of the fluid.

As to the vein selected it appears to be immaterial so long as one is chosen with lumen of sufficient size. In these cases the median cephalic or the median basilic has been selected, but in one case where the veins could not be well demonstrated by tourniquet a superficial vein over the "snuffbox" was utilized. Thus far the veins have been ligatured, but in the future suturing of the incised vein is contemplated where there is sufficient lumen. The skin incision is usually about an inch in length, an effort being made to get within the sheath of the vein in all cases.

The sterilization of the arm has been by the iodine method in all cases, and it leaves little to be desired. The only instruments needed are a sharp scalpel, a pair of small scissors which will cut at the very point, a pair of mouse-tooth forceps, a grooved director, a tourniquet, a pair of mosquito hæmostats, plain catgut No. 1 for

tying off the vein, and medium-sized silkworm gut for skin suture. The mosquito hæmostats are ideal for picking up a fold of the vein. It is much better if the vein be cut with a V-shaped incision, apex distally placed. The tourniquet is kept in place until the vein is exposed; it is then removed and the vein tied off on the distal side. The vessel is grasped with the mosquito hæmostat, care being taken to include only a small fold of the vessel wall. One loop of the proximal ligature is now completed and allowed to rest very loosely; as soon as the solution is prepared the vein is snipped in the manner spoken of above, the canula passed in, and the proximal ligature tightened behind the shoulder of the canula. We have only the simplest apparatus, and this has worked very well. Gravity hardly suffices, and it is necessary to have a bulb above the container to pump gently. From four to six minutes are usually consumed, and with a self-regulating and heating apparatus it would probably be better to extend the time to eight minutes, especially in those cases in which the arteries or heart show evidence of any sclerotic change. It goes without saying that the solution should be as near the temperature of the blood as possible. No anæsthetic of any kind has been used and there is little complaint of pain. It is worthy of note that one of the cases fainted at the sight of blood, and it is needless to say that the administration was continued as soon as we were assured that the patient's heart action was good.

The patient is kept flat on his back during the administration and for 24 hours afterwards. This precaution is thought best, but in two or three cases the patients, despite repeated warnings to the contrary, got out of bed and walked the length of the ward within less than an hour after the administration and seemed to suffer no inconvenience whatever.

Now a few words as to the effects of the administration *per se*.

The patient usually remarks as soon as the flow has started that he feels a little warm and flushed. Before he gets off the table there is usually slight flushing and more or less perspiration; the pulse becomes slow and full. These effects are simply in common with those observed in ordinary intravenous injection. Within two or three hours they usually feel a slight dizziness, often associated with headache and a feeling of nausea. A few go on to slight vomiting which is usually limited to one or two mild efforts. In one case only was there an intense headache, and this lasted for 24 hours. Two or three cases have shown fever of an appreciable degree, and in one case it reached 103° F., the pulse being proportionately accelerated. Two cases had slight chills occurring after about six hours. There were three cases of erythema, one being especially marked, occurring about four hours after administration and lasting about three hours, followed by more or less scaling of the epithelium. We are in doubt

as to whether the reactions mentioned above were due to some fault in our technique, such as a too rapid flow, variation of temperature, or whether it was specific to the drug itself or to the absorption of luetic endotoxins liberated in the blood stream. The Herxheimer reaction was noticed in a few cases. One of the cases of erythema mentioned is of special interest. It was a case of marked involvement of the liver and gall bladder with associated jaundice, giving a luetic history of a year's duration. Within two hours after administration he vomited, had slight fever and chill, and broke out all over the face and anterior body surface with an eruption resembling measles. These symptoms, including the erythema, disappeared within four hours. It is hard to say whether these were due to the drug, to the jaundice, or whether they were due to the loosening into the blood stream of syphilitic toxins.

There have been no cases of suppression of the urine, tenesmus, blindness, violent purging, or any of the untoward symptoms hitherto reported. Four cases have shown moderate diarrhea, which disappeared after about 24 hours.

Now, what of the clinical results of the 56 cases treated thus far with salvarsan? Before going into this it is only fair to state that all other specific treatment was stopped for at least two weeks before and during the time covered by these observations. As before mentioned, several of these cases were extremely resistant to vigorous mercurial treatment. All of the cases showed adenopathy of greater or lesser degree, which disappeared in from three to six days. Twenty-four cases showed mucous patches and these were entirely healed in from two to five days, some of them showing improvement in 12 hours. Well-marked rashes were present in 10 cases and these disappeared in from two to four days. There were five typical chancres, one on the lip, and these healed in from five to seven days, with exception of one, which healed on the eighth day. Four recent scars of chancres lost all induration in about three days. Four incised buboes, which had been discharging for weeks, healed in less than five days. Two psoriasis forms of eruption cleared up entirely in six days. Alopecia was checked in the two cases within two days. In one of the alopecia forms there was marked salivary flow (not ptyalism) which necessitated a large receptacle for the saliva. This flow was especially offensive and many mucous patches were present. The flow was checked in 18 hours, and the mucous patches were healed in 36 hours. Two cases of broken-down glands of the neck were reduced in size in three days and completely healed in eight days. One case of periostitis of the tibia (large open area) healed in two weeks. This case had been healing very slowly after two months of mercury and potassium iodide. The case of marked liver and gall bladder involvement with associated jaundice, before

mentioned, cleared up completely in a week. One case of paralytic ileus from some obscure central lesion referred to us by Passed Asst. Surg. Strine was of special interest. The man gave a clear history of syphilitic infection contracted 10 years ago. An exploratory operation had revealed nothing, and he was unable to retain food, to have a normal bowel movement, or even to pass gas. He was practically *in extremis*, and, owing to the fact that it was probably a degenerative lesion and also on account of his weakened condition, only about 0.3 gram was given. Within two days he retained food and passed gas by bowel, and within four days he was eating grape fruit, soup, custard, etc., and having bowel movements. The final outcome is in doubt, but this at least shows the innocuousness of the remedy *per se*. The most unsatisfactory case was that of an old man with an immense leg ulcer of many years standing (N. A. S., steward); he had poor eyes and heart; 0.3 gram was given and repeated on the eighth day. It is now about three weeks since the first administration and about three-fourths of the area is healed.

Two cases of pustular syphilide are of special interest. They commenced to clear up within two days and the crusts fell off, but they were not entirely clear until five or six days after the second dose, which was given on the seventh to the tenth day.

In all cases there was a marked increase in appetite and weight, beginning almost at once. Many of the cases gained as much as a pound a day for two weeks. The red blood cells and the hæmoglobin were increased in all cases; usually there was a leucocytosis, and in some cases an eosinophilia, as much as 4 per cent in one case. In nearly all cases the syphilitic cachexia disappeared and a marked bleaching effect was noticed. A deposition of subcutaneous fat was frequently noticed, puffiness around the eyes has been noted in a few cases, and occasionally a transient albuminuria. It was observed by one of the patients that his sore (large chancre, ulcerating) felt and healed better in the open air with no dressing. Following that the method was tried on another and this case also healed more satisfactorily with no dressing.

Patients suffering such pain from sore throat that they could not swallow were eating and enjoying dry toast in 24 hours.

What conclusions can be drawn? Is it a permanent cure? It is too early to state this positively, notwithstanding the persistently positive Wasserman reaction to the contrary; but it has never been determined what is the full dose or when to repeat it. The first cases were undoubtedly given an insufficient dose, and among these have been the recurrences.

We believe that the dose should not be less than the present "ampule," and that it should be repeated in from 7 to 10 days.

It has been demonstrated that the most striking results have been obtained in the early stages, and the more severe the infection the more rapid and striking the healing.

For the Navy this method, properly used, is indispensable as a rapid means of returning men to duty, and, whether it is proved to be a permanent or a temporary cure, it should supersede the mercurial treatment in the first and second stages.

To secure the most efficient action the intravenous method should be chosen. This method is simple, painless, rapid, and in four days a man could do full duty. There is no danger if care and judgment be exercised.

Solutions should not be used unless clear, and should be filtered through sterile white Swedish filter paper. The solution, of course, should be sterile.

It should not be given intravenously in a higher concentration than 1 to 500 or 1 to 600. The only contraindication to giving the full dose is the sudden introduction of that quantity of fluid, not the harmful effects of the drug itself. By this we mean the *immediate* harmful effects, for the later supposed harmful effects are open to question since syphilis itself causes all the affections of the organs of special sense which have been laid to the door of salvarsan.

The first harmful effects reported were due in all probability to the use of methyl alcohol in preparation of the drug for administration.

The cases above mentioned were treated at the United States Naval Hospital, Norfolk, Va. We owe our thanks and appreciation to Surg. Garton, United States Navy, of that hospital, for helpful suggestions and to Hospital Steward H. P. Knowles for his unfailing interest and intelligent assistance.

EHRLICH DISCUSSES "606."

Abstract of translation by Dr. J. C. BIERWIRTH.

[From the report of proceedings of the section on dermatology at the meeting of the Society of German Naturalists and Physicians at Königsberg, Prussia, Sept. 20, 1910, published in the Berliner Klinische Wochenschrift, Oct. 24, 1910.]

Ehrlich said: If a sufficient dose is given, the spirochætes disappear in 24 to 48 hours; if they do not, I would take it as sufficient evidence that the dose was too small, the resorption conditions unfavorable, or that arsenic tolerance has occurred in the spirochætes, for which there exists certain evidence. [This disappearance of the spirochætes after a "sufficient dose" suggests the specificness of the remedy.]

The second evidence of its specific action is the formation of specific antibodies. For a long time endeavors have been made to demonstrate the existence of specific antibodies, which should be

able to produce a specific cure, but in vain. Neisser has labored long in this direction. In the cure with "606" there seems to be proof for the existence of these bodies. Neisser found that in a syphilitic mother nursing her child, after treatment with "606," the influence of the milk had a decidedly favorable influence on the hereditary syphilis of the child, the various manifestations disappearing rapidly. These observations have been confirmed by Duhot, Raubitschek, and many others. It is well known that milk will hold only an infinitesimal amount of arsenic; it is also known that the new remedy would not act in such entirely insufficient amounts, so that one is led to the conclusion that antibodies are formed and reabsorbed. Interesting confirmation of this comes to me from Marinescu, Plaut, Scholtz, Michaelis, and Meirowsky, who tell me that serum from patients treated with "606" tends to produce resorption of syphilitic affections. This proves again the formation of specific antibodies, which are able to inaugurate a cure. I am of the belief that such a serum treatment would not be sufficient to produce a cure, for if of 1,000 spirochætes *one* remain behind, this one is sufficient to produce *relapsis*. The nursing immunity is, however, of the greatest importance in hereditary syphilis of infants. Wechselmann found that first after injecting such infants an apparent prompt cure resulted, to be followed after six to seven days by severe illness, caused no doubt by the setting free of enormous masses of endotoxin from the destroyed spirochætes; therefore these toxins circulating in the blood are the cause of the secondary illnesses. The increase of the antibodies, however, would exclude these occurrences. Here the greater mass of spirochætes are killed, and as the antibodies have neutral characteristics, the rest of the spirochætes are made harmless. We thus have a strong, healthy child who has a few spirochætes. We then give such a baby a sufficient dose to kill the rest of the spirochætes. This would again prove the specific action.

A second specific action, which perhaps is of still greater practical value, is the sero-reaction, which was first discovered by Wassermann, Neisser, and Bruck, and which is of great importance. From all available observations, it seems certain that this reaction stands in close connection with the presence and vegetation [vital activities] of the spirillum. This is a well-known fact and I need not refer to it here any further. A series of interesting observations has been made by several investigators, which shows that a negative reaction becomes first positive under the influence of the injection and subsequently gradually disappears again. This takes place in primary chancres at certain periods, and also, but less often, in certain forms of latent syphilis. In certain forms in which a negative Wassermann is present, a positive reaction is produced by the injection. How is this explained? I believe, and I think you will agree with me, that in such

cases the number of spirochætes is small—too small to give a positive Wassermann—but the injection suddenly dissolves out from the infiltrated and encapsulated deposits such numbers of spirochætes that the Wassermann becomes positive. Such a positive reaction would, therefore, be proof positive of the syphilitic character of the malady treated. We can now estimate the value of the Wassermann reaction in the treatment with "606." We may state positively that any case is not cured which shows a positive Wassermann reaction. But we have a certain number of cases in which the reaction remains negative. That the reaction remains negative does not mean much; I think, as Neisser has explained, this negative reaction is only for a time. It may be that the remedy has destroyed all the spirochætes, of say, 1,000 except 100; this small number is not sufficient to give a positive reaction, but as they gradually multiply a positive reaction is the result. Therefore, every positive reaction following a previous negative one is to be considered in the same light as a relapse, and should be treated by a reinjection, even if no external evidences are present.

The treatment of syphilis by "606" is therefore, in view of the above statements, not as simple as would appear at first thought. I have, however, never made the statement that all that is necessary is to inject the patient and then discharge him as cured. It will be the duty of physicians in the future to examine their cases at stated intervals by the Wassermann reaction. This is a serious problem for the future, and it would be of the greatest value if a way could be found by which the Wassermann test could be made readily by every physician.

There is another effect of the remedy which is very difficult to explain. It has been reported to me from various sources that the remedy has often a marvelously rapid effect. Cases unable to swallow solid food for many months on account of severe pain in deglutition had great relief a short time after injection. For instance, a case of gumma of the tonsil, treated for two months unsuccessfully, unable to swallow solid food, and injected at 2 o'clock, could eat bread and butter at 7 o'clock (five hours later) without pain. Analogous cases can no doubt be cited by many observers. I know of one case of roseolar eruption disappearing in three hours; cases of pain in the bones, where the pain disappeared in a few hours; disagreeable sensations of the throat, so often found in syphilitics, disappear as if by magic; in one case patient had continuous itching of the tongue cured one hour after injection. Anatomical changes can not have taken place in such a short time. When a man can masticate who previously could not, something must have been taken away; we are therefore brought to the conclusion that the cause of pain is due to a substance secreted by the spirochætes. If we assume that

"606" combines in some way with the toxin and thus influences the pain, that would be the simplest explanation. We can assume that the remedy combines with the products of secretion and thus acts as an antitoxin. There are, however, certain observations which seem opposed to such a view, namely, the fact that the opposite occurs—an increase in the symptoms. This observation is old and has occurred in the treatment by mercury; after injection, then occurs an intense redness, hyperæmia. The first case of this kind comes to me from Italy, where they were in the beginning extremely cautious in the use of the remedy, giving doses of from 0.025 to 0.05 gram, and apparently with good results; the spirochætes disappeared, only to reappear in 5 to 10 days. The explanation in these cases is, according to my view, that the parasites were not killed, but were stimulated by the remedy. This increase of the poison secreted occasions the local symptoms. I am of the opinion that these various manifestations are due to insufficient action, i. e., insufficient dose.

Now, a short word as to the therapeutic side of the remedy. I have always considered all arsenical preparations as dangerous and have always contended that such a dangerous remedy should first be extensively tested. We can not expect that a remedy which kills the parasites in the body is entirely harmless. But the consideration of these remedies as poison should be a relative one. Consider, for example, chloroform, and use soldiers for its administration; you may give it in 50,000 cases without a single death; administer it to all classes of patients, and you have 1 death in 2,060 to 2,080, a fairly regular mortality for many decades; but if administered to persons having heart disease, a mortality of 1 to 2 per cent, or even more, would result. The mortality of chloroform is not constant, but is dependent upon the quality of the patients. This law is applicable in all therapeutic preparations.

The next step in the use of a new remedy is experimentation, which meets many obstacles, for everyone using the remedy may meet with patients who have a natural hypersensitiveness for the drug and who may die under its administration and thereby cause great trouble to the physician. I have had the good fortune to have Prof. Alt, in Germany, and Prof. Iversen, in St. Petersburg, make the first observations in the use of the new remedy. Prof. Alt used it principally in paralysis and later, with Hoppe and Schreiber, in recent cases of syphilis, and he was the first to establish its wonderful curative results, while Iversen independently made studies in relapsing fever, curing the disease in every instance with one injection and without relapses. These results only completed a small portion of the task before us, because I considered it necessary to have reports in at least 10,000 to 20,000 cases before turning the remedy over to the profession at large. It was necessary to know exactly the dangers

of the remedy and to know when and where to look for them. The problem was not easy, because the testing of such a remedy has many difficulties and because I could not personally participate in all the tests. To use such a remedy at once on a large scale would be unwise, because damage would surely be done which could be avoided by having the remedy used by a few men under the greatest care.

I selected the following gentlemen to carry on the first work: Wechselmann, Stern, Pick, Neisser, and Schreiber, and later other eminent men were added. I now have records of 10,000 cases, and I believe that probably 12,000 have been injected.

It has been proved that in the main the remedy is without danger. In this large number of cases there has been only one fatal one which properly could be ascribed to the remedy. This case was in Jena, a woman who should not have died and in whom the death was no doubt due to shock. She was suffering from tertiary syphilis of the larynx and was very weak; she received an injection of an acid solution which was locally strongly irritating and very painful. The other deaths, which were barely a dozen, were in cases of serious disease of the nervous system, such as tabes with cachexia, cases of idiocy in patients with softened brains, severe tabes with paralytic symptoms, etc. These were all cases in which the injection evidently caused death, because they died a few hours after, but they were *without the injection* candidates for death. But I am of the opinion that even a hopeless case should be injected if we have hope only of some improvement. Every surgeon undertakes a dangerous operation to relieve, improve, or cure, and if the issue is otherwise, and even causes death, the remedy should not be blamed. Buschke used the new remedy in five cases with two arsenic poisonings, which will seem very peculiar to one who has observed patients treated with "606." A case of severe epilepsy shows the value of "606" in desperate cases. Patient had been an inmate of an insane asylum for two years and did not know his own mother. After the injection he had a frightful epileptic seizure, and the attending physicians expected death any minute. But the patient recovered and was so much improved that in four to five days he could speak, write, and read. Another case, of most severe syphilis with pneumonia, was at first refused the injection because he was too weak; but the attending physician decided to give the remedy on the following day, with the result that the temperature dropped to normal in a few hours, and the patient was so well the following day that he wanted to leave the hospital.

In bad paralytics I believe it is dangerous to use the remedy; even if it were possible to cure the syphilis in one of them, his brain would be so seriously damaged that he would not be a useful member of society.

The drug is contraindicated in cases of diseased heart and arteries. I know of one case who died promptly after injection, in whom an aneurysm had ruptured. Even if we destroyed the spirochætes the aneurysm remains.

I would request an expression of those present here as to the technic. In the main the intravenous injection works quickest, and is well borne in doses of 0.4 to 0.5 gram. The best solution seems to be the alkaline, which has been tested by Alt and Iversen, and which has as the only objection that it is pretty painful. The neutral emulsion of Michaelis and Wechselmann has the advantage that it is much less painful. The choice lies between these two forms and depends somewhat on the character of the patient. In neurasthenics, alcoholics, people sensitive to pain, or in whom pain produces an objectionable effect upon the heart, the neutral solution would be preferable, while in other cases where the pain can be disregarded the alkaline should be used, as it is the most effective and theoretically the best.

I believe it will be best in the future to combine both forms of injection, intravenous and subcutaneous. The double injection as practiced by Iversen seems the best in otherwise healthy individuals. The patient receives 0.4 or 0.5 gram intravenously and a second dose subcutaneously or intramuscularly, the latter being slowly absorbed. For the second dose the neutral solution is used, or the paraffin emulsion as practiced by Volk and Kromeyer.

The question as to amount of the dose depends on the patient, and no arbitrary directions can be given. In diseases of the nervous system small dose should be given, not more than 0.4 gram, bearing in mind that here we have patients who are hypersensitive and who may react badly as regards heart and nervous system. In these cases, furthermore, the number of spirochætes is very small and a small dose only is necessary to kill them. It is important to use the Wassermann test continuously as a control, in order to arrive at a clear understanding of the curative value of the remedy. This is the most important part of the therapy. The time thus far elapsed is too short to say the final word as to syphilis. Of special value is the work of Alt in paralytics whose work with arseno-phenyl-glycin covers two years. This preparation is the same as "606" in its curative value, but has often shown disturbing after effects, which materially interfered with its use.

Alt found that in 16 per cent of the paralytics the Wassermann reaction disappeared, and thus far after two years has not returned, which promises much for the future.

To recapitulate as to treatment: Cases with few spirochætes, paralysis, tabes, and spinal syphilis require small doses, which, if insufficient, may be repeated. In otherwise strong individuals I

believe we should endeavor to get the full effect by the first dose, and that if necessary 0.8 to 1.0 gram can be given without danger, and I believe we may even go much higher. It is impossible to determine definite results in six months.

The remedy has also been used in other diseases, e. g., "yaws," which is analogous to syphilis. The remedy has been tried successfully in the human subject in Manila for treatment of this disease. Infection by chicken cholera-spirillum is promptly cured by "606." Relapsing fever has been cured by Iversen. Malaria has been much benefited. Dr. Haller reported the cure of one case of smallpox of such severity as to be classed among the ordinarily fatal cases. This observation has been corroborated by my assistant, Marks, who infected rabbits with vaccine, and then shaved the skin of the back according to Calmette's method. The animals treated with "606" remained free, while the uninjected ones showed a strong vaccination.

DISCUSSION.

ALT gave a review of this preliminary work in "606," first on animals, then on two assistants, with a dose of 0.1 gram to ascertain the local reaction. He confirmed his previously expressed view concerning the undesirability of producing new deposits of the drug in the body before we are reasonably certain that the previous dose has been used up. He cautioned particular care in patients with a chronic nervous disease, because "606" has not only great affinity for the spirochætes but for all newly formed syphilitic tissues, producing a hyperæmia zone around the latter, and if this occurs in an unyielding capsule, like the skull, it may produce pressure variations which at times may prove fatal. Such observations were made when using arseno-phenyl-glycin. In paralytics of the spastic form the remedy should not be used, because a seizure might easily be produced. Only in paralysis in the beginning and in tabo-paralysis can the remedy be used with success. Brain syphilis holds out good promise of cure by "606." The venous injection should be used with the care advocated by Schreiber. In tabetics, the relief of the pains is experienced only after the pain from the injection has passed away; during the latter period the pains are apt to increase. Atrophy of the optic nerve has not been observed by Alt.

SCHREIBER, of Magdeburg, said the pains of the intramuscular injection, and particularly the fact that the strong alkaline solution, as well as the powder emulsion, produced necrosis, prompted him to use the intravenous injection. He showed his technic with a specially constructed canula. The intravenous injection, if technically correctly used, employing a greater dilution, is no more dangerous than other drugs similarly administered. He did not observe any untoward symptoms in 400 cases, even when a second dose was given. A 50 per cent ointment is of value in condylomata on account of its escharotic effect. The fatal cases of Buschke were due to faulty technic and not the remedy. He has never claimed that the remedy is not poisonous. He also emphasized small doses in nerve cases, especially with cerebral symptoms.

IVERSEN (St. Petersburg) reported 60 cases of relapsing fever cured by "606." Dose, 0.3 gram. The attack is cut short and there are no relapses. Spirochætes disappear in 3 to 10 hours, temperature becomes subnormal, and profuse sweating ensues.

He reported on 100 cases of syphilis. First he used the intravenous; now combines this with the intramuscular injection, giving a total of 0.8 to 1 gram. In six cases there were relapses, which disappeared after second dose. These had had less than 0.4 gram at first injection. In all stages of syphilis the effect was equally astounding, specially so in cases of malignant syphilis which had for years resisted treatment. Aspiration of enlarged glands of the groin showed no spirochætes 3 to 5 days after injection.

IVERSEN has also used the remedy in malaria. He cured at first a few cases of tertian fever; subsequently treated 27 tertian, 4 quartan, 27 tropical, and 2 mixed tropical and tertian cases; dose 0.45 to 0.8 gram intravenously and subcutaneously. Tertian fever was cured in 70 per cent of cases by intravenous injection. Plasmodia disappeared permanently in 12 to 24 hours. Spleen tumor becomes smaller, except in a very few old cases. In 30 per cent the paroxysms stop, but the parasites remain in the blood. He treated only four quartan cases. Two of them did not react and two had less severe paroxysms with less fever. Tropical malaria reacted poorly. The improvement was only transitory. The parasites do not disappear from the blood, and in a few days the fever returns. In four cases symptoms of irritation by the drug were observed similar to those described in syphilis treated by insufficient doses, i. e., recrudescence of the disease as manifested by fever, stronger attacks and appearance of new rings in the erythrocytes. In two other cases there was increase of fever after five days, and instead of new rings the semilunar form of parasite appeared. He suggests a combination of "606" with quinine, which might lead to a cure.

ORTH, of Berlin, demonstrated two preparations of the parts injected with Ehrlich's "606." (1) Case of tabes, death 12 days after injection, a mass size of walnut, with yellow periphery and red center, although looking like pus; microscope showed no suppuration, neither did bacterial examination. The mass was principally composed of dead muscle fibers. (2) Death six weeks after injection. Case of carcinoma of pharyngo-larynx showed some microscopical findings of injected area.

MARGULIES, of St. Petersburg, found in *trypanosomes* that carefully increased doses of "606" produced a tolerance of the drug and had no further influence on the microorganisms, even in maximum dosage. The parasites had become immune. It took much longer to produce this tolerance by chicken-cholera infection, and when finally tolerance was established, so that double the ordinary curative dose was without effect, it was found that the spirillum had lost much of its virulence.

The spirillum of relapsing fever could, however, not be made immune to the drug; after a tolerance to one dose had been established a slightly increased dose would produce a cure promptly. The spirochæte of syphilis acted in the same way.

SCHOLTZ, speaking of technic, said that the injection according to Wechselmann may be slow and irregular in effect on account of incapsulated infiltrate.

He cited a case of hereditary syphilis, in which he gave to the mother 0.5 gram and found the papulo-squamous skin eruption healed in 10 days.

L. MICHAELIS, of Berlin, spoke in favor of the use of the neutral suspension and denied that the effect of the alkaline solution is quicker. The best method is the injection deep into the muscles of the back. The infiltration here is much less.

GROUVEN, of Halle, in reporting 200 cases, advised against its use in severe circulatory and nervous diseases. He does not recommend the intravenous injection on account of many unknown factors to be considered. He advises to

proceed cautiously in cases of headache, fever, gastro-intestinal disturbances, and gout. The neutral injection is less painful, but the result is slower.

GLUCK, of Sarajewo, reported 417 cases. There were seven recurrences which were all treated by 0.3 gram dosage of "606." He advises watching all cases which heal slowly. He has used doses so large as 0.7 or 0.8 gram, and in all his cases observed only one arsenic intoxication.

FRIEDLANDER, of Berlin, reported 80 cases.

VOLK, of Vienna, advocated the suspension of "606" in liquid paraffin or olive oil.

H. CITRON, of Berlin, reported on his technic. He makes his solution directly in the syringe and uses calcium carbonate for a precipitant and neutralizer. He claims absolute sterility of the solution, a neutral emulsion, nonirritant action, the small amount to be injected (only 6 to 8 cubic centimeters); and the absence of caustic alkalies and acid avoids all decomposition of the original preparation. His results emphasize the above conclusions.

NAGELSCHMID, of Berlin, has treated a large number of tabetics. He begins with a very weak injection, which is often followed by exacerbation of all symptoms after the reaction has subsided, i. e., after one or more weeks a second dose of same size or a little larger, and so on until 1.5 or 2 grams have been taken. He has had excellent results in improvement of patients. He urges in these cases not to use the maximum sterilizing dose.

SATISFACTORY RESULTS WITH A SIMPLIFIED WASSERMANN TECHNIQUE (EMERY).

By Surg. E. R. STITT, United States Navy.

During the past few months we have made serum examinations by Emery's technique of almost 50 individuals in whom there was a question of syphilitic infection. Those cases which were clinically syphilis invariably gave a strong positive reaction, while in cases which were presumably nonsyphilitic the test was negative. A case of locomotor ataxia with a negative luetic history gave a strongly positive reaction.

As indicating the reliability of this modification of the Noguchi test two cases having a diagnosis of climatic bubo gave positive reactions when there was no suspicion of a syphilitic infection. In one of these cases a marked secondary rash appeared three days later, although the site of a primary lesion could not be found. The other case, when history was gone into more fully, justified the positive Wassermann.

It would seem advisable that the question of a syphilitic factor in these cases of "climatic" or "tropical" bubo be thoroughly studied by the tropical hospitals having to deal with such cases.

Emery, in the article describing his technique (the Lancet of Sept. 3, 1910), states that it has been used in over 200 cases with uniformly excellent results. In a footnote to the same article he states that since writing the article he has still further used it in an additional 100

cases and that he is convinced that the results are decidedly better than those claimed for the standard Wassermann test.

As this test is distinctly more convenient for use in the service than the Noguchi, the method usually employed in the Navy, I have made the following brief extract of Emery's article:

Apparatus and reagents required:

1. Wright's opsonic pipette, 1 millimeter internal diameter and having 1 unit and 4 unit marks.

2. Test tubes, ½ inch by 3 inches, in a two-row stand.

3. Immune serum from a rabbit injected two or three times intraperitoneally with 5 cubic centimeters of washed human red cells at intervals of one week. To standardize, add 1 volume of 20 per cent emulsion of washed human red cells plus 5 volumes of human serum plus 1 volume of various dilutions of the immune rabbit serum. A dilution which gives very good hæmolysis is made the standard immune serum. After standardizing, heat serum to 60° C. for one-half hour, and it can then be preserved in sterile containing tubes (sealed bacteriological pipettes).

4. Serum to be tested is taken in Wright U tubes from the finger. To get serum satisfactorily, it is best to place at once the U tubes in 37° C. incubator (to keep warm). Separate the clot from the sides of the tube by shaking down as clotting commences. Then centrifuge.

5. Antigen is made by grinding up a certain number of grams of normal heart muscle with four times its weight of absolute alcohol; allow to stand for 24 hours and repeat the grinding process. Again allow to stand for 24 hours, after which heat to 60° C. for one hour. In using, draw off the clear upper portion with pipette and dilute to 1 in 10 with normal saline. To test antigen, take two tubes, one containing 1 volume normal serum plus 4 volumes normal saline and the second tube 1 volume of the same serum plus 4 volumes of extract of heart diluted as above. Incubate the two tubes for one-half hour at 37° C. and add to each 5 volumes of 20 per cent emulsion of washed human red cells. There should be no marked difference between the two tubes.

Technique.—In a series of tubes, in a two-row stand (according to the number of sera to be examined) put in the first row of the stand 4 volumes of normal saline. In an equal number in the back row put 4 volumes of the diluted extract (1 to 10). Now add 1 volume of a given serum to be tested to the 4 volumes of saline in the front test tube. Next add 1 volume of the same serum to the 4 volumes of diluted extract in the tube in the back row. This order avoids carrying over extract into the front tube. Mixing in each case is done by sucking up with the bulb pipette. The pipette is now rinsed with normal saline and a second serum treated as above. Place tubes in incubator for one-half hour for fixation of complement.

For the hæmolytic system make a mixture of 1 part of washed human red cells and 4 parts of the standardized immune rabbit serum.

The final stage is to add one unit of the hæmolytic system (well mixed) to the contents of each test tube—the order, however, being reversed—that is, to add first to the extract tube in the back row and then to the saline tube in the front row (to avoid carrying over complement from the front-row tube).

It would seem that the employment of filter paper impregnated with antigen and immune serum would further facilitate the use of this method on board ship. It would furthermore seem better to employ an acetone insoluble lipoid as antigen.

FURTHER NOTES ON THE PREPARATION OF A CULTURE MEDIUM FROM DRIED BLOOD SERUM.

By Asst. Surg. E. W. Brown, United States Navy.

I. Sterilization.—Since the previous publication[1] on the preparation of a culture medium from dried blood serum the writer has noted that special care must be taken in the sterilization of culture media made from dried blood serum. The intermittent method with the Arnold sterilizer does not kill *B. subtilis* and other organisms which are more or less present in the dried material. Heating in the autoclave at 8 pounds pressure invariably disrupted the great majority of the slants, even though the pressure was raised very gradually. Indeed, trials in which the pressure was elevated at the rate of 1 pound in 10 minutes gave unfavorable results. The difficulty was overcome by sterilizing in the autoclave *in vacuo.*

The plan as finally adopted is as follows: The tubes containing 2 parts of 12½ per cent serum and 1 part glucose bouillon are slanted in shallow pans and placed in the autoclave about midway between front and back. The door being left open, the steam is cautiously let in and carefully increased until the heat can just be borne by the hand. About half an hour should be required until this degree of heat is reached. Steaming is now continued under these conditions for another half hour. The autoclave is then sealed, the vacuum cock is opened, and steam is slowly admitted to the chamber, the pressure being raised gradually to about 10 pounds. This pressure is maintained for 45 minutes. This sterilization *in vacuo* is repeated on the second and third days. The results obtained by this method are most satisfactory.

II. Stability of the dried material.—The powdered serum appears to keep indefinitely when hermetically sealed. Containers were opened one year from the date of sealing and the serum was apparently unchanged; it dissolved readily in water to clear solution and coagulated in the usual manner. It does not, however, keep well in bottles as ordinarily corked. In warm weather a distinct change of odor is soon noted, and complete solution of the material can not then be obtained. In the writer's opinion, the entire contents of a container should be tubed at one time, as after being once exposed to the air its keeping qualities are impaired. Since the former article on the subject was written the manufacturers have been enabled to prepare a clear white serum which is more satisfactory than the dark material heretofore used.

III. Fat-free dried milk—A substitute for bouillon in this medium.—The writer is indebted to Dr. Thomas Leary, of the Tufts College Medical School, for information regarding the use of fat-free

[1] U. S. Naval Med. Bul., vol. 4, No. 3, p. 327, 1910.

milk as a substitute for bouillon in the preparation of serum media. He states that the "milk serum" is made in exactly the same manner as the Löffler's and is put together in the same proportions; nothing is added to the fat-free milk. He has found the medium as satisfactory as the ordinary Löffler's. It occurred to the writer that the fat-free dried milk prepared by the Merrell-Soule Co., of Syracuse, N. Y., might be used as a substitute for the bouillon with the dried blood serum. The advantages in simplicity of preparing the medium by a solution of the two powders in water are obvious. The dried milk is first dissolved in the proportion of 1 part to 9 parts of water, and 1 part of this solution is added to 2 parts of the 12½ per cent blood serum. The writer has had no opportunity for comparing this medium with the dried serum and bouillon mixture, but plans to do so in the near future.

NOTE ON THE EXISTENCE OF AGCHYLOSTOMA DUODENALE IN GUAM.

By Asst. Surg. WILLIAM M. KERR, United States Navy.

In No. 4, volume 4, of the United States Naval Medical Bulletin, Surg. E. R. Stitt, United States Navy, notes the possible existence of both *Agchylostoma duodenale* and *Necator americanus* at Guam, and states that so far only *N. americanus* has been reported from Guam.

On December 5, 1910, 14 children were admitted to the United States Naval Hospital, Guam, Marianas Islands, from the native clinic for worm treatment. Examination of the stools passed after the administration of vermifuges showed the presence of *Agchylostoma duodenale* in each case, as well as *Trichuris trichiura*, *Oxyuris vermicularis*, and *Ascaris lumbricoides*, specimens of which have been forwarded to the Department of Helminthology, United States Naval Medical School.

INTESTINAL PARASITES FOUND AMONG THE CREW OF THE U. S. S. "SOUTH DAKOTA."

By Surg. E. G. PARKER, United States Navy.

The great prevalence of uncinariasis in our country and the recent general interest in intestinal parasitology led me to conduct this examination, with a view to determine what proportion of our crew might be infected, more particularly with hookworm.

The subjects first chosen were those whose enlistment records showed them to have been born in or to have recently resided in well-known hookworm-infected localities.

One hundred and twenty-seven such men were found, and the examination showed parasites as follows:

Agchylostoma duodenale	6
Ascaris lumbricoides	3
Trichuris trichiura	8
Strongyloides stercoralis	2

This examination showed the six cases of agchylostomiasis to be confined to the coal passers exclusively. With the idea that these six coal passers, by reason of their specific duties, might have spread the infection to their immediate associates in the firerooms, the investigation was extended to include all other coal handlers—i. e., all the coal passers and firemen, second class, on board.

One hundred and twenty-five subjects were examined in this group with the result that no spread of infection was found. Two cases of ascaris alone were noticed.

A further investigation of the Filipino mess attendants disclosed an interesting condition. Of the 20 mess attendants examined, 75 per cent showed agchylostoma, and 100 per cent showed the trichuris trichiura. All hookworms recovered from the stools after treatment had been given were found to be agchylostoma duodenale.

In examination of 273 individuals there were found:

	Cases.
Agchylostoma duodenale	21
Ascaris lumbricoides	5
Trichuris trichiura	28
Tænia nana	2
Strongyloides stercoralis	2

None of the subjects showed characteristic objective clinical evidences of agchylostomiasis, other than a mild grade of anæmia and an eosinophilia as shown by the differential blood count.

In the course of this examination a patient (not one of our subjects selected for examination) applied for treatment for nausea and vomiting with severe epigastric pain; he was put on the sick list and given a cathartic which brought some relief after two days.

He returned to duty and two days later had a second attack of nausea and epigastric pain. He soon vomited a large female ascaris lumbricoides with great and permanent relief. Repeated examination thereafter failed to reveal any further sign of parasites, so one may conclude that the disturbance must have been produced by a single worm.

With regard to the treatment of agchylostomiasis, the following method devised by a physician of large experience has given great satisfaction.

With the usual preparatory treatment and the careful exclusion of alcohol, fats, and oil from the diet, 30 grains of thymol are given in

two doses, about two hours apart. The thymol is allowed to remain in the intestinal canal for four hours, when a purgative saline is given to sweep out the thymol and its victims, the hookworms.

The preparation and method of administration of thymol are most important. It should first be thoroughly pulverized, then placed in cachets. Just before administration the cachets are soaked in water until they become of the consistency of a raw oyster. In this form they are readily swallowed and the thymol is well deposited over the intestinal tract so that it comes readily in direct contact with the parasites. The administration by capsules is not so reliable in that after ingestion the thymol frequently becomes a solid mass and is thus passed through the intestinal tract, affecting the parasites but little.

One person to whom 30 grains of thymol were given, in cachets, responded immediately with 108 hookworms.

I am much indebted to Asst. Surg. L. W. McGuire for able assistance in carrying on this investigation.

RESULTS OF AN EXAMINATION OF FILIPINO MESS ATTENDANTS FOR INTESTINAL PARASITES.

By Passed Asst. Surg. W. A. Angwin and Asst. Surg. C. B. Cameron, United States Navy.

On November 7, 1910, M. S., mess attendant, third class, was admitted to sick list with agchylostomiasis, the eggs having been found in the fæces. A systematic examination of all the Filipinos aboard was then begun, with the following results:

Number examined	21
Number having only agchylostoma ova	3
Number having agchylostoma and trichuris ova	14
Number having only trichuris ova	3
Number having trichuris and ascaris ova	1
Total having ova of some kind	21

To obtain these results the following method was used:

In the evening the man suspected of harboring parasites was given a vegetable cathartic and his stool saved the next morning. From this stool a liberal sample was taken, mixed thoroughly with water, and centrifuged. From the last sedimentation, after washing until clear, a slide was made and examined under low-power lens. The results varied from 1 to 125 hookworm eggs, from 1 to 900 whipworm eggs, and in the round-worm case 13 eggs were recovered. This was believed by us to be a quicker and more satisfactory method than that advocated by Garrison in the United States Naval Medical Bul-

letin, volume 4, No. 3 (p. 348), which method was also tried on all positive hookworm cases.

The agchylostoma eggs recovered were all of the same type and differ from the four or five celled eggs usually seen in the textbook pictures, whereas the ova recovered from these cases were of the many-celled type. Only twice has the four-celled type been found—one in the stool from a Filipino examined in March, 1910, and the other from a worm of the present series squeezed under a cover slip.

From 14 of the 17 cases showing hookworm eggs, agchylostoma worms, ranging from 3 to 59 in number with an average of 25 per man, were recovered. None of the infections was heavy. All worms were of the same variety, showing platelets in mouth, and, in the male, bipartite dorsal rays in the tail and were classed as *Uncinaria americana*. None was found with hooklets in mouth.

The hæmoglobin estimates varied from 80 to 100 per cent with an average of 95 plus. The eosinophilic count varied from 2 to 14 per cent, with an average of 7.2 per cent, exclusive of one case with 29 per cent, possibly complicated by old gonorrhea, although no trace of the latter disease could be found. Lymphocytes varied from 19 to 47 per cent, with an average of 30 per cent; and neutrophiles, from 44 to 75 per cent, with an average of 60 per cent.

In order to cure the patients of hookworms, they were put to bed and a cathartic given in the morning of the first day. No food was given the first day. At 6, 7, and 8 a. m., on second day, 1 gram of thymol was given, followed at 10 a. m. by Epsom salts. Food was allowed at noon. All the stools passed from the beginning of the administration of thymol until the salts had finished purgation were saved, thoroughly separated under water, and strained through gauze. The residue caught in the gauze was washed in water until clear and thin enough to see into. The worms sank to bottom quickly and were easily picked out. Many of them stuck to the gauze. It was washed from the reverse side before being discarded.

The stools were also sedimented for eggs and several samples reserved in formalin 4 per cent. After 12 hours an examination showed the eggs still alive. The formalin for preservation was made 10 per cent and found satisfactory.

THE PRACTICAL USE OF CARBON DIOXIDE SNOW AS SEEN AT THE WEST LONDON HOSPITAL.

By Passed Asst. Surg. Gordon D. Hale, United States Navy.

During the recent visit of the U. S. S. *Idaho* to England I was enabled, through the courtesy of Dr. MacGregor, of Greenhithe, to visit the West London Hospital. This is a large hospital, doing an

ımense out-patient work and having a post graduate department here medical officers of the British Army and Navy are sent for clinıl work. A certain day was selected in order that I might see the e of carbon dioxide snow as practiced by Dr. Reginald Morton, R. C. S. Dr. Morton was very kind and went through the entire ocess, from the making of the snow candle to the treating of ıchoma and nævi, thus permitting me to observe his technique.

The process of preparing the snow for use was as described in the stract of one of Dr. Morton's papers, which appeared in the Janry, 1911, issue of the United States Naval Medical Bulletin.

The large cylinder containing 25 pounds of liquid CO_2 was used a generator. A folded towel made into a cylinder by rolling ɔund a cylindrical ruler was held over the opened valve at one end the generator until filled with snow. The soft crayon of snow s taken from the towel, broken into fragments, and pounded o a corked brass cylinder. This cylinder may be of any size, ording to the use to which the snow crayon is to be put. This yon is pushed from the brass cylinder and may be whittled, as a ıcil, to any shape. This solid CO_2 snow pencil is of a temperature —79° C. and will last for two hours.

Dr. Morton uses it for treating capillary cavernous nævi, port ıe marks, lupus vulgaris, warts, moles, and trachoma. Cavernous vi and warts often require only one treatment. Several applicaıs may be required for some of the other affections.

was fortunate in being able to see Dr. Morton treat a case of ernous nævus, also trachoma. The crayon, shaped to exactly cover nævus, which, in this instance, was about 1 inch in diameter, was l firmly applied for about 40 seconds; the result was a depressed te area, which in a few minutes became firm, red and raised ve the surrounding skin. This is a "plastic inflammation withnecrosis." A vesicle forms in about an hour, followed by a crust few days. The crust is allowed to come away of itself. A scar ɔh is indiscernible from the surrounding skin is the end result r a few months. The dressing consists of merely aseptic gauze.

also saw trachoma treated. This is a more delicate operation, ral applications of much shorter duration being necessary before ɜnd result of a complete disappearance is obtained.

MENCLATURE FOR CAUSES OF PHYSICAL DISABILITY IN THE NAVY.

By Surg. CHARLES N. FISKE, United States Navy.

submitting for the bureau's consideration a tentative list of ; for which I purpose, under its direction, to seek adoption in oming meeting of the representatives of the Government medical

services with the chairman of the committee on nomenclature and classification of diseases of the American Medical Association, the following observations are offered:

The suggested expansion of the International List of Titles has been arranged solely to meet the needs of naval medical officers, and, with few exceptions, such as the omission of amœbiasis, morbus lethargicus, and icterus, it has been assumed that all causes of disability found in the naval nomenclature (form K) are required, notwithstanding the fact that 55 of its 398 titles were not used on any ship or station during the calendar year 1909. A few titles have been added, such as sunburn, imbecility, weak-mindedness, (traumatic) ruptured ear drum, heat cramps, and evisceration, besides a certain few from the Army list, which are obviously as desirable for the Navy (e. g., varieties of alcoholism, piles, amœbic and bilharzial infections, and "under observation," "undiagnosed," or "unknown").

The name commonly used by leading practitioners and educators guided the selection of titles with the exception of the already accepted spelling of such words as "septichaemia," "osteitis," and the avoidance of the hybrid "tonsillitis" by substituting "amygdalitis," as recommended by members of the committee of the American Medical Association. "Periostitis" is probably and "tonsillitis" is possibly too firmly impressed to justify any attempt at change, but the Navy's chief interest should be to see that all its needed names shall be specifically covered by whatever title may be agreed upon in committee.

The expanded list contains but few titles not included in the nomenclature of the Royal College of Physicians (1906), or that of Bellevue Hospital (1909). "Aphthous oral ulcer" seemed to be the clearest title to cover the relatively unimportant "canker sores" of the laity, and "necatoriasis" might be taken from Le Dantec to distinguish the disease caused by the New World hookworm from that caused by *Ankylostomum duodenale*, and at the same time to avoid the use of the name of the infecting agent for the disease. "Gonorrhoeal diseases of the eyes" has been suggested (by Surg. Shipp) to comprise other lesions than ophthalmia. There seems to be little choice between "piles" and "haemorrhoids" so far as the profession itself is concerned.

White's classification of mental diseases might well be substituted for titles under 68, especially since student medical officers of the Navy and Army are familiar with it at the Government Hospital for the Insane.

The history and progress of the present movement to internationalize medical terminology for statistics has been so fully re-

ported in medical journals, Bureau of Census publications, and by Surg. Pleadwell in the Naval Medical Bulletin (vol. 3, No. 4) that space need not be devoted to them here. The next decennial revision of the International will occur in 1919, and the conference may not improbably be held in Washington. On that occasion it is hoped that not only will the "classification" idea be abandoned, but that few, if any, changes in the designation numbers will be made; such additions will be made as the advance in medical science and art seems to justify.

The want of international naval medical statistics has been long felt, and particularly regretted since the development of the international military medical statistics of the Armies of Bavaria, Prussia, Belgium, Denmark, Spain, France, Great Britain, Holland, Italy, Japan, Portugal, Russia, Sweden, Norway, and the United States. In this international nosological list for armies, Latin was used for the reason that the present International Classification or list had not been developed, the titles are few (only 38), and the numbers are really all that is required for international comparison.

By the mere publication, as an appendix to the report of the Surgeon General of the Navy, of its combined table (No. 18) translated by key numbers into terms of the unexpanded International List, our own service could well take the initiative; it is believed that this method will be the one most likely to appeal to the naval services of other countries, and perhaps most promising of results in inducing them to do likewise without the necessity of any formal convention.

The readiness with which the civil authorities of other countries are adopting the International List, or adapting it to their needs, lends encouragement to the hope that naval services may be far better served than have the armies with their very limited Latin list.

The arrangement of table or tables adopted may for the present be well left to the judgment of each Navy, unless we may cherish the hope that the form of our own table will, as a pioneer effort or precedent, influence others to use similar column headings. With this idea in view, and the understood intention of the Bureau of Medicine and Surgery to compile such a table in its next annual report, I have been led to translate such a table to embrace the Navy's morbidity statistics for the calendar year 1909. In accordance with the suggestion of Medical Inspector Gatewood, readmissions and transfers to hospitals (other than those for treatment of insane and of tuberculosis) have been eliminated as having little significance to those outside the service, and being even misleading to ourselves. The discharges to duty have been adjusted to make up the total of all cases not otherwise disposed of. The key numbers used, with two unimportant exceptions, are those found pre-

ceding the titles of the Navy Nomenclature, e. g., "virium defectio" was included under "186" instead of "177A," for the reason that its intended meaning of exhaustion from overexertion was not sufficiently apparent to prevent 4 individuals being invalided from the service on account of it, as if it were not classed under injuries and meant defective strength or exhaustion from disease. The 128 discharges from the naval hospital, Las Animas, and the 42 deaths occurring elsewhere than at stations from which statistical returns were rendered, have been included in the appropriate columns. Certain apparently erroneous admissions, such as 9 for acute miliary tuberculosis, have been adjusted, although the totals of cases and dispositions, except the corrected discharges to duty, invalidings, and deaths, remain the same as found in the original report. Gatewood (Naval Hygiene, 1909) states that—

> The vital statistics of the Navy * * * represent an analysis which is necessarily at the foundation of all inquiry of sanitary progress. * * * The statistics of any one year, however recent, have little value except that evolved through comparison with those of prior years. * * * Statistics of recent years have some values peculiarly their own, but also other very important values that depend exclusively upon comparison with the statistics of antecedent years. With an understanding of the methods employed and of the data relating to recent years, it will be practicable for anyone to utilize the material available in any future year and to make the comparison that may be desired. * * * The diseases of our Navy are the diseases of all other navies, but there seems to be no way of determining, with even a reasonable degree of accuracy, whether the relative importance of the different diseases is much the same in the different services. There are not only differences in nomenclature, but also of methods, which are more disturbing in attempts at comparison. Navies are not much interested in the comparison of their vital statistics with those of armies, but much good could be accomplished by an international convention for the adoption of a nomenclature of diseases to be used by all naval services and an international form of returns that could be utilized for comparison in connection with a detailed statement of methods employed.

From his personal labors Gatewood has given the service in his statistical Table 4, the "expected year," from 10 peace years (1895–1905), percentage of sick, death and discharge rates, and total damage in percentage of sick for all important causes of disability, which could well be readjusted into terms of the International List, while the translation of tables for 1906, 1907, and 1908 could be compiled in a few weeks in the manner of the one for 1909 submitted with this table. The service would then have sufficient data for 16 years with which to compare any subsequent year's figures were it to adopt at once the International List as expanded by the American Medical Association. It would thus be needless to incur the otherwise unfortunate delay until the 1919 revision to accumulate tables (duplicated) in both the present Navy and the international nomenclatures.

Should the medical department of the Navy adopt, to begin with the year 1912, the International List of Titles for Diseases and Causes of Death or its expanded list as will undoubtedly be approved by the American Medical Association during its approaching annual meeting at Los Angeles?

The accompanying lists and table have been taken or compiled for comparison and to assist in the better advised answer to this question.

At the outset it is probably best for our service to ignore the idea of classification as a negligible factor and in the interests of harmony where the varying experiences of the medical professions of the several nations give promise of failure for accord and reconciliation.

The practical utility of any classification of causes of morbidity, whether based upon anatomical, biological, or other grounds, seems to be losing favor in the minds of English speaking statisticians, probably for the reason that in many affections, the uncertain etiology and extent of infections and pathology is foremost rather than last in our thoughts.

No disability classification lacking perfect elasticity, however satisfactory it might appear to its authors, could be hoped to meet the varying needs of the several countries, of their many groups of individuals, and particularly of the physicians of varying education and experience.

That such classifications fail to satisfy even a comparative few working in the same direction is apparent from the disagreements among the best of specialists; our own classification, however improved, requires constant readjustment of certain titles for hygienic studies and interpretations, as has been found in compiling certain tables in the Surgeon General's report, the naval hygienist will wish to "classify" tonsillitis under contagious diseases despite the fact that the lesions are located at the upper end of the digestive tract. Any system of grouping diseases for a service like the Navy is likely to be misleading to outsiders, if not to its own workers, without considerable interpretation and uncertain explanation in the text. If the surgeon turns to the combined tables to ascertain average duration of the disabilities in which he is interested, he can hardly be blamed for wondering why all fractures from skull to phalanges are agglomerated opposite the single title "fractura" while such nice (and unused) distinctions are to be found elsewhere in the same list as "amœbiasis" and "dysenteria amœbica" and "trypanosomiasis" and "morbus lethargicus."

That the International has glowing faults as a "classification" and should not be accredited with the generally accepted properties of a desirable "classification" is as apparent to those (especially English-speaking statisticians) who value it most highly for its proper services

as to the casual critic who objects that cerebro-spinal fever is, and soft chancre is not, a general disease.

The following quotations from Appendix II, Mortality Statistics, 1908, Bureau of the Census, are pertinent to the general consideration of the whole subject:

It is evident that much of the value of the statistical tables relating to causes of death will be lost if they are not fully available for comparative purposes. A universal statistical classification of causes of death that should be used by every city, State, and country in the world that publishes mortality reports has been the hope of vital statisticians for many years. This end has not yet been attained, although there is a greater degree of correspondence between all of the national methods of classification at present than in times past, and a large number of the nations of the world have united in the use of an absolute identical system known as the "International Classification of Causes of Death and Sickness," the second decennial revision of which has just taken place under the auspices of the French Government, at Paris, July 1 to 3, 1909. * * * The purpose of the decennial revision as expressed in the original propositions therefor made by the American Public Health Association in 1898 and indorsed by the International Statistical Institute in 1899 is that the classification may be kept abreast of the constantly advancing knowledge of pathology, so that the sanitarian and physician who desires to consult the official statistics of causes of death will not be obliged to employ obsolete and discarded medical terms. For the same reason the Nomenclature of Diseases of the Royal College of Physicians of London has been revised every 10 years since 1869, and the American Medical Association, through its committee on nomenclature, is planning a similar authoritative work for this country, which will likewise need to be kept up to date by periodical revisions. * * * The orthography of the list, which differs somewhat from that previously used in the annual reports, is that recommended by the committee on nomenclature of the American Medical Association. Lastly, in examining the general form of the "classification," it should be remembered that the scientific classification of diseases, in the primary sense of the word, is a thing apart from the object of this list, which is merely a list of causes of death, arranged by international agreement for use in mortality tables. The use of the word "list" in this connection is strongly recommended by such eminent authorities as Dr. Arthur Newsholme and Dr. John Tatham and follows in the practice of the latter in the tables of causes of death in the annual reports of the registrar general of England, wherein only the individual causes are presented, and the so-called classes or groups of diseases are dispensed with. A motion to dispense with the "classes" in the international system nearly prevailed at Paris, but the general opinion favored the retention of the "classification" as a mere skeleton upon which to arrange the all-important individual titles for at least one decade more. In the annual reports on mortality statistics prepared by the Bureau of the Census very little attention will in future be paid to the "classes" of diseases, and the word "classification," which is familiar to registration officials and the statisticians in the special sense of a mere tabular arrangement of causes of death (see Mortality Statistics, 1907, p. 22), will be abandoned more and more in favor of the terms "list" or "tabular list."

It is clear that Form K as now used in the service could hardly be so extended as to include all such conditions as deviation of or spur on nasal septum and frontal sinusitis, which are perhaps too com

monly met to compel the service's rhinologists to lose in "Other diseases of this class"; but when Form K is abolished for the service at large and quarterly abstracts (Form F) are combined in the bureau as contemplated, the naval medical officers should have copies of the almost unrestrictedly elastic list of the new American Medical Association from which to select the exact names of morbid conditions which would, by the use of the International numbers, give the statistical clerks no difficulty in compiling. Much unnecessary work might be saved by replacing the quarterly abstract itself with a card to embrace data now returned on "F" and the clinical card by the use of a card similar to that of Bellevue Hospital. The number of names which officers would have desired to, but could not, use with any assurance of retention in statistics for the year 1909 can not be guessed, but they might not have greatly exceeded the 55 titles for which no use was found, so that the published statistical tables would not have been materially lengthened.

One objection to the unexpanded International List, which would promptly occur to every medical officer, is that the nomenclature was primarily designed for the compilation and statistical comparison of *causes* of *death*, while a military service requires full *morbidity* statistics as much as those for mortality. This objection is shared by the large civil hospitals and is what the efforts of all English-speaking vital statisticians with the American Medical and American Public Health Associations are now trying to meet. It is assured that the revised "manual" contemplated by the Bureau of the Census and the American Medical Association list will be sufficiently comprehensive for the purposes of Government medical officers, and the principle of subexpansion found in the accompanying list should solve the problem for the Navy in a manner quite as satisfactory as it has for the Army since 1904.

Some titles in our own list seem to be susceptible of varying translation and interpretation, and medical officers are frequently found in doubt as to meaning or intent of "virium defectio," "lithæmia," "thecitis," "pernio," "phagadæna," "parulis," etc.

Suggestion has been made to publish a translation of our Latin titles into English, a confession of an insufficiently classical preliminary education to interpret all the terms, hence the artificiality of Latin terminology in itself—it being no longer necessary for the understanding of foreigners—for whom the Latin was never consistently provided in headings, footnotes, and discussion. In this connection we may venture the truism that should Esperanto attain its goal and all medical practitioners throughout the civilized world become adept in its use the titles, as well as numbers, could be rendered universally available without key or translation.

With the present naval nomenclature it is impossible to determine with precision damage due to gonorrhea, for the reason that inguinal adenitis, phimosis, stricture, etc., of venereal origin represent sequelæ of both gonorrheal and chancroidal infection in proportions not declared in the returns.

Objection might be offered that one infection (case) might, through admission for divers complications, appear statistically as several cases, but this could be obviated by applying a *general* rule, such as is to be found under one class only (Class XII) in Form K, that for the same continuing affection or infection there shall be but one admission and pure complications shall be returned as readmissions of the original or most important disease with the title of complication following in parenthesis. There appears to be as good reason for considering pneumococcic otitis media or meningitis complicating pneumonia as the same case as for returning a gonorrheal balanitis as a readmission under gonorrhea.

Our nomenclature does not provide for leprosy, exophthalmic goitre, location of cancer, gangrene of lung, senility, cholera nostras or various forms of suicides or homicides and yet does use such symptoms and indefinite conditions as "cephalalgia," "icterus," or "diuresis." In the list of the Royal College of Physicians of London diuresis appears to be synonymous with "diabetes insipidus," a term which is therefore a duplication.

Anyone favoring a nomenclature in Latin may point to the fact that neither the unexpanded translations of the International nor the titles suggested for its expansion to meet the Navy's needs is entirely in English, but the names accepted are believed to be those most widely used among English-speaking physicians, and after all general usage may here be trusted to govern in keeping with the modern trend of medicine to make Latin its servant in place of its old-time master.

It is not a question why the International List was not made in Latin; the International in its present form is unquestionably an accomplished fact until the next decennial revision in 1919. As in the matter of classification, already dismissed, international cooperation and concession are not promoted by the service of any one of the signatory powers holding out for what it, in its restricted and even specialized field, may consider a superior system after its duly accredited representatives have been given full opportunity to voice its views before the convention.

Any Latin list would require a key for each modern language as much as with the present arrangement and the universal use of the numbers assigned facilitates comparison of most diseases worthy of special designation. Any more detailed analysis for comparison

of the statistics in another language could be made by translation with a polyglot lexicon, as is now required and doubtless would be required with any Latin list conceivable of general acceptance.

From the foregoing observations it is seen that any alphabetical arrangement is as out of the question as it is unnecessary. The numerical sequence is sufficient, and even that, while convenient, is not essential, provided the identical number is always used to designate the same affection or group.

The inclusion of a few symptoms, such as anemia and hemorrhage, may be deemed unfortunate from a scientific point of view, but inability to always make a more definite diagnosis is manifest in the users of most nomenclatures, that of the Navy being no exception, wherein is to be found even more such titles as "anæmia simplex," "vertigo," "cephalalgia," "icterus," "aphasia," "insomnia," "neuritis optica," "otalgia," and "surditas."

Although other advantages for adopting the International will come to mind, the all-surpassing advantage of ready comparison with statistics from other sources should be sufficient, and the attempt has been made to meet every argument advanced against its adoption by our Navy and those of other nations. When most civilized countries are taking it up and making great concessions to do so, more than half our own civil population (practically all the registration area of the United States) have their causes of death reported under it, and the other Government medical services have either used it or declared their intentions, it is submitted that the Navy can hardly afford to be placed in the ultra-conservative position of neglecting the opportunities which might be derived from its use.

I am indebted to Dr. Cressy L. Wilbur, chief statistician for vital statistics of the Bureau of the Census, and to Lieut. Col. Jefferson R. Kean, Medical Corps, United States Army, for the suggestion and transposition of several titles to insure that the expanded list shall conform to the manual of the Bureau of the Census and also meet the needs of the Medical Department of the United States Army.

UNITED STATES NAVAL MEDICAL SCHOOL LABORATORIES.

AN ATYPICAL TYPHOID BACILLUS.

By Passed Asst. Surg. O. J. MINK, United States Navy.

This organism was isolated from the stools of a patient who had had typhoid fever two months previously.

The organism agglutinated with a dilution of 1–5,000 of immune horse serum. The cultural characteristics were typical, except that milk, after showing the usual primary acidity, remained slightly acid at the end of a month and at no time became alkaline.

NOTES ON THE PARASITES FOUND AT ANIMAL AUTOPSIES IN THE NAVAL MEDICAL SCHOOL LABORATORIES DURING 1910.

By Surg. C. S. BUTLER and Passed Asst. Surg. P. E. GARRISON, United States Navy.

Twelve dogs, 10 cats, and 10 wild rats have been examined for animal parasites by the classes in attendance at the school during the past year. The following brief summary of the parasites found includes one or two forms of interest, because of their supposed rarity in this locality, and illustrates the abundance and variety of parasitic material available in these animals for purposes of instruction, even in a nontropical latitude.

Filaria sp.—Of the 12 dogs, 2 were found with microfilaria in the blood. Careful search failed to discover the adults in the heart, blood vessels, or other viscera. The animals were not skinned. The embryos were without sheath. There are reasons for thinking that the parasites are not *F. immitis*, but without additional data we are not prepared to express any further opinion regarding the specific identity of the worms. The presence of two infections in only 12 dogs would give a rate of over 16 per hundred, a very much higher percentage of infection than has been supposed to prevail among dogs of this locality. One infection was found in the late fall (Nov. 15), the other in April.

Trypanosoma lewisi.—Of 10 wild rats, one was infected with trypanosomes. This rat was caught in the school building. The material was used for starting a strain of infection in laboratory rats.

Trichinella spiralis.—One wild rat (caught near the city market) was heavily infected with trichinæ. This infection has since been kept running in laboratory animals.

Hymenolepis diminuta.—Five infections were found among 10 rats.

Hymenolepis nana.—One infection with the dwarf tapeworm was present in a white rat which had been infected with trichinæ. The larval form (*Cercocystis*) was found in the intestinal villi.

Tænia pisiformis (syn., *T. serrata*).—Three infections with this species of tapeworm were found among the 12 dogs autopsied.

Tænia teniæformis (syn., *T. crassicollis*).—This species was found twice among 10 cats autopsied.

Dipylidium caninum.—With the exception of *Ascaris* in the cats, *Dipylidium* was the most common parasite encountered among cats and dogs. It occurred 6 times among the 12 dogs and 6 times among the 10 cats.

Cysticercus fasciolaris.—Of the 10 rats, 8 harbored this bladder worm in the liver. Some of the larvæ have been fed to a cat, with a view to obtain the adult tapeworm (*Tænia teniæformis*) and to continue the infection experimentally, in rats and cats alternately, in the laboratory.

Agchylostoma canina (syn., *A. trigonocephala*).—Of the 5 infections with hookworms found among the 12 dogs, all appeared to be of this species, although each individual worm has not been sufficiently studied as yet to positively determine its specific identity. No hookworm infections were found in the cats.

Ascaris canis.—This occurred 8 times among the 10 cats and 5 times among the 12 dogs, this being the parasite most frequently found in these animals, excepting *Dipylidium* in the dogs.

Trichuris depressiusculus.—Whipworms were found in the cæcum of only one dog.

Trichosoma hepaticum.—Four of the 10 rats harbored this nematode in the liver.

Trichosoma crassicauda.—This was found in the urinary bladder of 7 of the 10 rats, and in 2 of the remaining 3 rats the bladder was not examined, because of poor condition of the animal in one case and lack of time in the other. Thus only 1 rat of 8 examined failed to show this parasite.

Heterakis spumosa.—Pinworms, which, so far as examined, appear to belong to this species, were present in the cæcum and large intestine of practically all the rats, having been found in 8 of the 9 animals in which the intestine was opened.

It should be noticed that while the autopsies were made as thorough as was compatible with classroom work, all of the organs and tissues

could not be studied with equal care in each and every case, and it was not practicable in the time allotted to the work to open bony cavities, such as the cranium and nose.

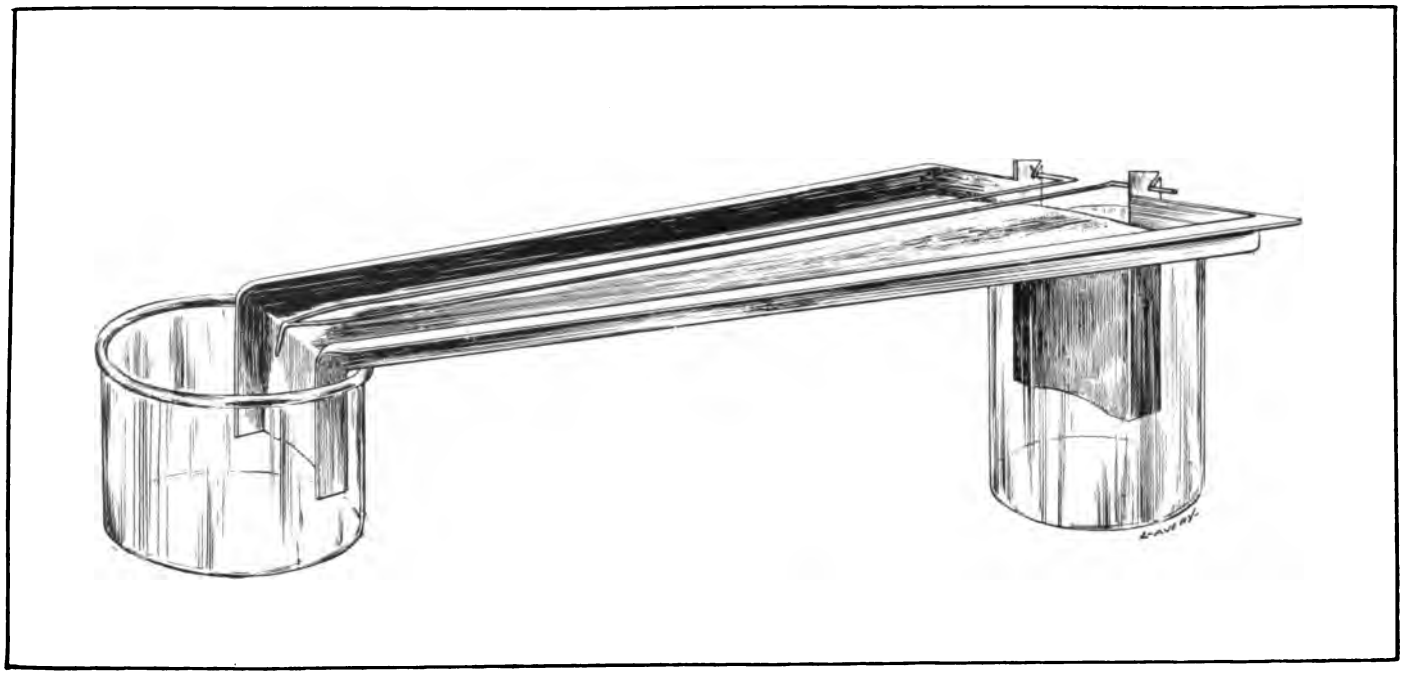
SPECIMENS ADDED TO THE HELMINTHOLOGICAL COLLECTION, UNITED STATES NAVAL MEDICAL SCHOOL, DECEMBER, 1910–FEBRUARY, 1911.

Accession No.	Names.	Host.	Collected by or received from—
19694	Ova: *Schistosoma japonicum*	*Homo*	Allen J. Smith, University of Pennsylvania.
19695	Ova: *Schist. mansoni*, *Trichuris*, Embryos of *Strongyloides*.	do	Stalnaker and Shephard, Culebra, P. R.
19696	*Necator americanus*	do	W. A. Angwin, U. S. S. California.
19697	Ova: *Necator americanus*, *Trichuris trichiura*.	do	Do.
19698	*Necator americanus*	do	Do.
19699	do	do	Do.
19700	do	do	Do.
19701	do	do	Do.
19702	do	do	Do.
19703	do	do	Do.
19704	*Trichuris trichiura*	do	Do.
19705	*Necator americanus*	do	Do.
19706	do	do	Do.
19707	Dipterous larva	do	Do.
19708	*Ascaris lumbricoides*	do	Do.
19709	*Dibothriocephalus latus*	*Homo?*	New York Post Graduate Medical School, Department of Tropical Medicine, Capt. J. F. Siler, Medical Corps, U. S. Army.
19710	do	*Homo?*	Do.
19711	Ova: *Schist. hæmatobium*	*Homo?*	Do.
19712	*Dracunculus medinensis*	*Homo?*	Do.
19713	Ova: *Trichuris*, *Ascaris*, *Schistosoma mansoni*, Embryos of *Strongyloides*.	*Homo*	Stalnaker and Shephard, Culebra, P. R.
19714	do	do	Do.
19715	*Trichinella spiralis*	White rat	L. Avery, District of Columbia.
19716	Ova: *Schistosoma mansoni*	*Homo*	Stalnaker and Shephard, Culebra, P. R.
19717	*Oxyuris vermicularis*	do	W. M. Kerr, Guam.
19718	Hookworms	do	Do.
19719	*Trichuris trichiura*	do	Do.
19720	Hookworms	do	Do.
19721	*Trichinella spiralis*	White rat	L. Avery, District of Columbia.
19722	*Ascaris lumbricoides*	*Homo*	Stalnaker and Shephard, Culebra, P. R.
19723	Ova: Hookworm, *Ascaris* and *Trichuris*.	do	L. W. McGuire, U. S. S. South Dakota.
19724	Hookworms	do	Do.
19725	Ova: *Schistosoma mansoni* and others	do	Stalnaker and Shephard, Culebra, P. R.
19726	*Clonorchis sinensis*	do	A. W. Balch, Cavite, P. I. (1908) (264, Bureau of Science, Manila).
19727	*Cysticercus cellulosæ*	*Sus scrofa domestica*.	P. E. Garrison (106, Bureau of Science, Manila).
19728	Ova: *Paragonimus*	*Homo*	P. E. Garrison (127, Bureau of Science, Manila).

ADDITIONS TO THE PATHOLOGICAL COLLECTION, UNITED STATES NAVAL MEDICAL SCHOOL,[1] DECEMBER, 1910–FEBRUARY, 1911.

Accession number.	Tissue.	Diagnosis.	Collected by or received from—
467	Ear	Leprosy	W. M. Kerr, Guam, M. I.
468	Eye showing ossification of choroid.	Irido-choroiditis (gangosa and syphilis).	Do.
469	Growth from back of eye	Sarcoma	R. Spear, Naval Medical School Hospital.
470	Aorta	Minute ulcers (arteriosclerosis)	O. J. Mink, Naval Medical School.
471	Colon	(?)	Do.
472	Brain	Sarcoma	R. Spear, Naval Medical School Hospital.
473	Lung	Gangrene of left lung; Tb. consolidation of R.	W. S. Pugh, jr., Naval Hospital, New York, N. Y.
474	do	Hypostatic congestion. Syphilis?.	Do.
475	Omentum	Syphilis? *No Treponema pallidum* found.	Do.
476	Lung	Tuberculosis pneumonica	W. M. Kerr, Guam, M. I.
	Liver	Leprosy	
	Kidney	do	
477	Lung	Broncho-pneumonia	G. B. Crow, Guam, M. I.
478	Glands of neck	Tuberculosis	G. F. Cottle, Samoa.
479	Tumor	Giant celled sarcoma	Do.
480	Curettings from salivary gland.	Yaws? Inflammatory condition: no treponema found.	Do.
481	Tendon sheath (dorsal-carpal).	Tuberculosis	Do.
482	Skin glands	Filariasis	Do.
483	Liver and spleen from rat	*Spirochæta duttoni* (Celloidin block)	Naval Medical School Laboratory.
484	Liver from guinea pig	Tuberculosis (Celloidin block)	Do.
485	Brain, dura mater, ethmoid bone.	Sarcoma	R. Spear, Naval Medical School Hospital.
486	Pancreas	(?)	F. M. Shook (passed assistant surgeon, U. S. Navy), New York Post-Graduate Medical School and Hospital.
487	Brain	Meningitis	Do.
488	Lung	Tuberculosis	Do.
489	Liver	Toxic atrophy	Do.
490	Fœtus attached to broad ligament.	Ectopic gestation	Do.
491	Intestine	Carcinoma	Do.
492		Colloid carcinoma	Do.
493	Hemorrhoid tissue	No treponema found	J. R. Dykes, Naval Medical School Hospital.
494	Growth from toe	Not malignant; corn	Naval Medical School Hospital.
495	Spleen	Plague	P. E. Garrison, Naval Medical School (from Philippines).
496	(Slide mounts)	Cholera	Do.
497	Intestine	Bacillary dysentery	Do.
498	Testicle	Tuberculosis (?)	G. F. Cottle, Samoa.
499	do	Giant-celled sarcoma	Do.
500	Larynx	(?)	Do.
501	Testicle	Hydrocele	Do.
502	Heart	Dilatation	Sellers and Kerr, Guam.
503	(Vesical calculus)	Cystitis	Naval Medical School Hospital.
504	Patella, condyle of femur and of tibia.	Not tubercular. (Had been resected for subluxation.)	W. S. Pugh, jr., Naval Hospital, New York, N. Y.
505	Blood smears	Benign tertian malaria	E. R. Stitt, Naval Hospital, Cavite, P. I.
506	Various tissues	Acute miliary tuberculosis	Do.
507	do	(?)	Do.

[1] Most of the diagnoses given in the above list were made by Surg. C. S. Butler or by the person sending the specimen. In many cases they are merely provisional or approximate, and in no case should the diagnosis given be considered in the light of an official report upon the specimen, such reports being made directly by letter.



GARRISON'S INTESTINE TRAY FOR AUTOPSIES.

See page 163.

SUGGESTED DEVICES.

AN INTESTINE TRAY FOR AUTOPSIES.

By Passed Asst. Surg. P. E. Garrison, United States Navy.

The tray figured on the opposite page was devised for opening the intestine at autopsy. It consists of a copper sheet molded into the form shown and of a double-steel rod over which the gut is drawn.

The body of the tray is 30 inches long, 10 inches wide at the broad end, and 5 inches wide at the narrow end, and has a raised edge about an inch and a half high. The vertical trough at the upper end is 5 inches wide by 4 inches long, and the lower one 5 inches wide by 6 inches long, the raised border of the tray continuing along their edges. The floor of the tray is convex upward, being about 1 inch higher in the middle than at the sides, this bulge being necessarily flattened at each end in order to make the sharp downward turn of the vertical troughs. At the broad end the raised edges of the vertical trough are allowed to project an inch or so above the edge of the tray, thus forming two supports in which are slits to receive and hold in position the ends of the steel rods.

The steel rods are welded together at one end, the welded ends being smoothly rounded to a blunt point and bent rather sharply downward. Just above the bend the rods diverge, the degree of divergence being governed by the stiffness (spring) of the wire and the size of the animal for which it is intended (see below). The upper ends of the rods are bent outward at right angles, to be rested in the slits in the supports at the broad end of the tray. Two little pins or stops keep the bent ends of the rods from springing too far through the slits. The rods should be at least an inch longer than the body of the tray so that the point at the narrow end projects well beyond the tray itself.

For use, the tray is placed over two pails or large jars, the receptacle at the broad end of the tray being higher than that at the small end, in order to give a gentle slope, or the tray may simply stand in two shallow pans or dishes, the greater length of the vertical trough at the broad end giving the necessary slope. The intestines, cut free from the peritoneum, are placed in the vessel at the narrow

or lower end of the tray. The open end (gastric) of the gut is brought up over the welded point (the point entering the lumen) and is drawn up over the length of the rods, which are held in the slits of the supporting pieces. The section of intestine thus held open by the elastic rods is quickly opened up with scissors or enterotome and falls apart over the convex floor of the tray fully exposing the mucosa to inspection and to examination with a lens if desired. The intestinal contents are washed off with a small stream of water, carried to the side gutters and to the lower jar, bearing with them all ova and such worms as may escape detection in the tray. A second section of gut is then drawn up, the cut section being allowed to fall over the upper end of the tray into the vessel provided.

The contents of the lower jar (feces, with ova, worms, etc.) are allowed to settle, and may be examined in the laboratory in the same manner as any specimen of feces.

For the human intestine about "No. 6" ($\frac{3}{8}$-inch) steel wire is used, and is so held by the stops on the ends which enter the slits that the rods are held about an inch and a half apart. These rods answer very well also for large dogs. For cats and small dogs a somewhat smaller rod is used, and the arms of the U held not more than a quarter of an inch apart. For still smaller animals a small single rod is inserted, simply as a director in running the scissors along the length of the gut.

For the better detection of worms the floor of the tray should be painted or enameled black.

The copper is all of one piece excepting the raised edge at the broad end and the two vertical end troughs, which are smoothly soldered on, and all sharp corners and edges are avoided in order to facilitate cleansing and sterilization.

Opening the intestines has always been one of the most disagreeable, tedious, and time-consuming parts of the autopsy, and there is no question that it is the part most often done in a merely perfunctory manner, if not altogether neglected. In actual practice at the Naval Medical School the intestinal tray has made the operation not only less unpleasant and more expeditious, but has made possible a more thorough and satisfactory examination, and by its greater cleanliness it much lessens the danger of spreading infectious material.

A SUGGESTED IMPROVEMENT IN THE METHOD OF TAKING FINGER PRINTS.

By Passed Asst. Surg. F. H. Brooks, United States Navy.

The following method of procedure is employed at the United States Navy recruiting station at Omaha, Nebr., in preparing the fingers of certain recruits prior to taking the rolled and plain im-

pressions for the identification records required in such cases. This method is described with the hope that its publication to the medical officers of the service may prove of benefit to those who may have occasion to use it.

In many cases I have found that after the recruit scrubs his hands and his fingers have been further prepared by cleansing with alcohol and benzine the fingers are so moist that it is impossible to get a smooth film of ink on the fingers, and a print shows a small white spot with indistinct finger pattern where the moisture has been interposed between the finger and the inked surface of the glass plate. Repeated scrubbings and alcohol and benzine cleansings failed to prevent the accumulation of moisture on the fingers, and it was impossible to obtain satisfactory impressions. Many expedients were tried, but the one now in use at this station is the only one that has proved satisfactory. After the recruit has scrubbed his hands and his fingers have been cleaned with alcohol, followed by benzine, a small piece of gauze is so folded that the raw cut edges are tucked away in the interior of the package. This is done so that no small particles or threads from the cut edges may adhere to the fingers. One drop of oil of turpentine is dropped on the gauze, and the fingers of one hand are lightly brushed with it. Another drop of oil will be necessary for the other hand. If two drops of oil are placed on the gauze at one time a too thick coating of oil will be applied to the fingers of the first hand so treated. It is best to allow a few minutes to elapse before the prints are taken. I have found that the fingers remain free from moisture, and excellent impressions are obtainable after the lapse of half an hour or more. The oil of turpentine used is that obtained on requisition from the Navy Medical Supply Depot.

83602—11——4

HYDROPS OF GALLBLADDER. CHOLECYSTECTOMY.

See page 167.

CLINICAL NOTES.

A CASE OF CHOLECYSTECTOMY.

By Surg. RAYMOND SPEAR, United States Navy.

Mrs. N.; age, 23 years. No history of gall bladder, gall duct, or digestive disturbance. Gave birth to first child in August, 1910. Soon after confinement a movable mass was first noticed in the abdomen on the right side. She was examined by several medical men, all of whom made a diagnosis of movable kidney.

Patient was of medium build, the mass in her abdomen was easily palpable, and when examined previously to operation on two occasions it had all the appearances of being a kidney. The mass, as can be seen from the photograph, was about the size and shape of a normal kidney; it was freely movable, came down below the umbilicus, and could be replaced apparently into the right kidney pouch. Patient had frequent attacks of pain radiating from the back down the course of the right ureter into the right labium. These attacks occurred every few days and caused the patient to seek relief. She also gave a history of intermittent polyuria; this, in all probability, was erroneous.

The urine contained at one time a trace of sugar, but was otherwise normal. A culture obtained by catheter was sterile.

The right kidney was exposed by the usual vertical incision on the outside of the erector spinæ muscle and was found to be firmly fixed. The supposed kidney was then pushed backward, the peritoneal cavity opened, and what appeared to be a cyst was easily delivered outside the body. The cyst proved to be the gall bladder in a condition of hydrops. The cystic duct was occluded by a number of gall stones and was completely strictured near its junction with the common duct. The dilated cystic duct was adherent to the peritoneum over the right kidney, which in turn was adherent to the kidney; therefore, when the distended gall bladder dragged downward the kidney was pulled upon and a symptom complex simulating a typical Dietl's crisis resulted. The gall bladder, delivered from its peritoneal covering, was removed with the cystic duct by cutting through the strictured duct.

The ease with which the gall bladder was removed through a small kidney incision (it was only necessary to divide a very few fibers of

the quadratus lumborum muscle) brings up the point whether it would not be advisable to deliberately remove gall bladders with long pedicles through this incision. The drainage is ideal, the contents of the abdomen are not disturbed, and the liver, if fairly movable, can be drawn outside the body, while the cholecystectomy is being performed.

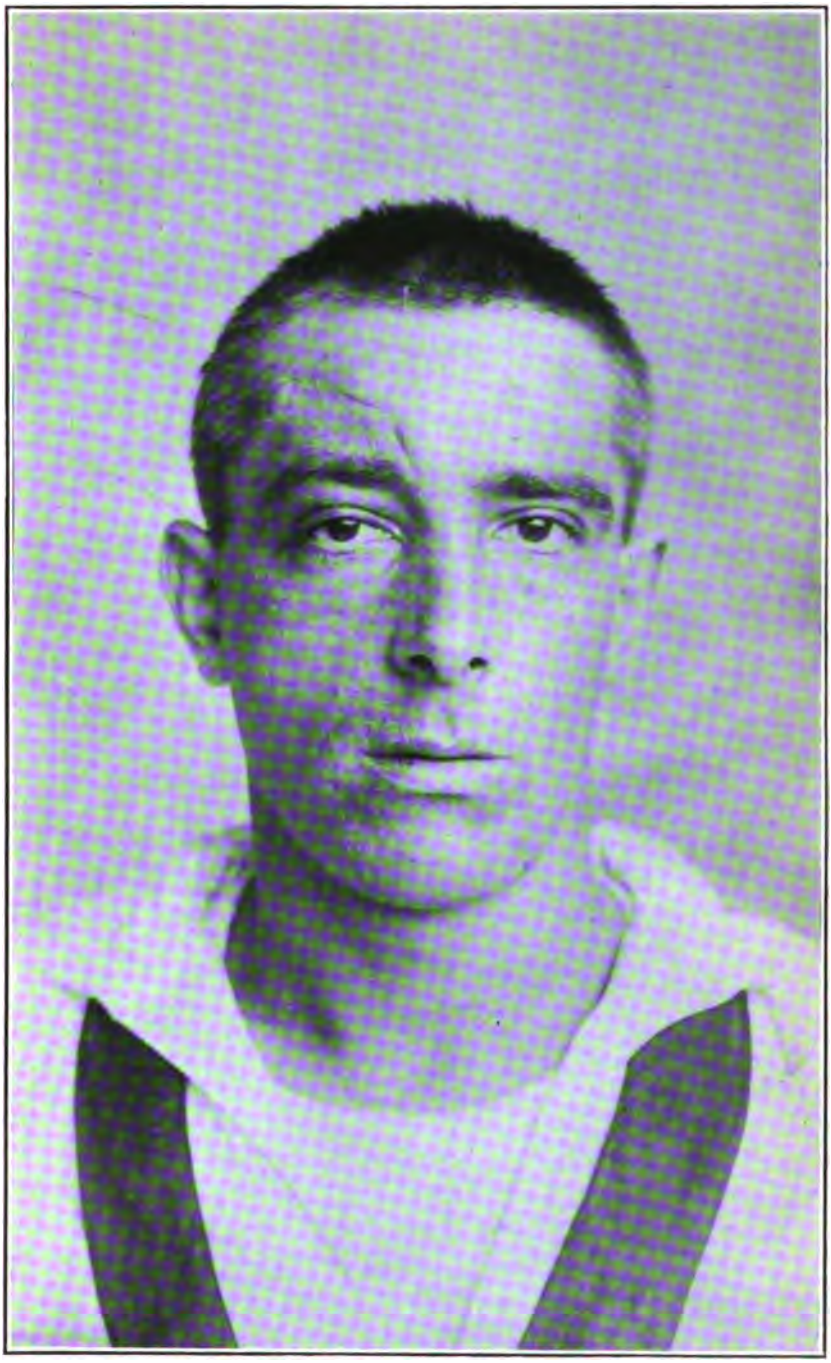
There was no leakage of bile after the operation and the wound healed by primary union. The patient returned to her home on the fourteenth day.

A CASE OF FRACTURE OF THE SKULL.

By Surg. W. M. Garton, United States Navy.

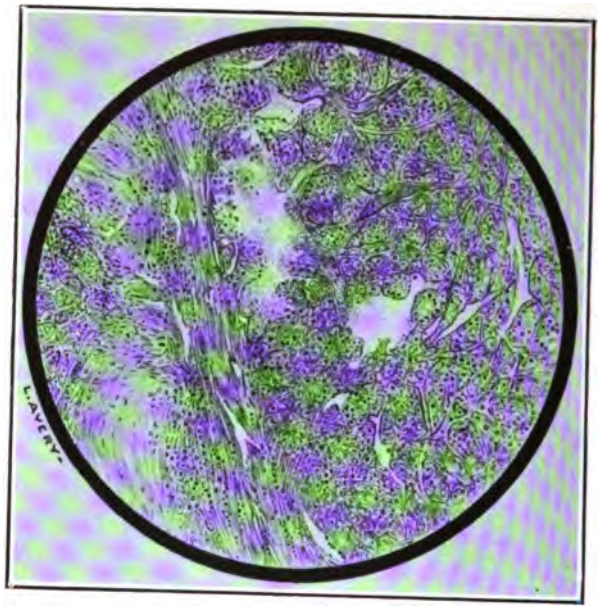
Patient was admitted to the United States Naval Hospital, Norfolk, Va., at 11 p. m., June 12, 1910. Two hours previously a hose nozzle thrown with great force struck him above the right eye. He was knocked down, but he was not rendered unconscious and was able to walk from the wash room of the ship to the sick bay. On admission the wound, which had the appearance of an incised wound, was an inch above and parallel to the right eyebrow and was 2 inches long. Depressed bone was found and the wound temporarily dressed. No symptoms of any kind were present. The absence of mental symptoms was noted. As the patient was left-handed and as no focal symptoms were present, it was concluded that the motor centers and nerve fibers were intact.

The following morning operation was performed. A U-shaped flap, base downward, and including the eyebrow, was reflected. The line of fracture began at the anterior root of the zygoma, curved upward 1½ inches above the orbit and down again to the glabella. The anterior bone surface was depressed and wedged in under the posterior surface. On the removal of the depressed bone the roof of the orbit showed a line of fracture extending from the antero-external angle of the orbit to the ethmoid, and a second line from the middle of the first line to the superior border of the orbit, just internal to the supra-orbital notch. From this point the fracture ran upward to meet the fracture of the vault. Thus a loose pyramidal fragment was formed whose base constituted the inner third of the roof of the orbit. This fragment was loose and was removed. In so doing cells of the frontal sinus, which were included in the fragment, were opened, converting the anterior fossa, the right orbit, and the frontal sinus into one cavity. The larger part of the roof of the orbit was removed in loose fragments. The superior border, from the supra-orbital notch outward, was intact. As a result the brain lay directly on the eye without bone intervening. The fragment of bone comprising the remainder of the roof of the orbit was

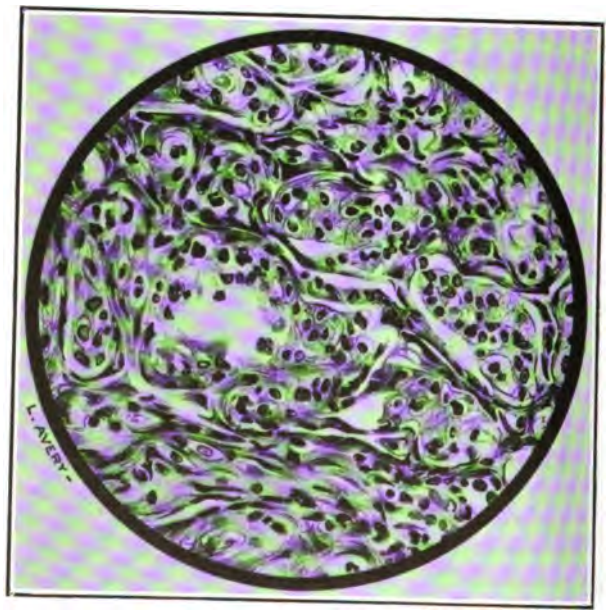


FRACTURE OF SKULL (ANTERIOR FOSSA). RESULT AFTER OPERATION

See page 168.



1. Low magnification.



2. High magnification.

HYPERNEPHROMA OF RIGHT KIDNEY.

See page 169.

loose, but was easily kept in position. The dura was uninjured and was not opened. The wound was closed with free drainage; hemorrhage from the anterior meningeal artery was controlled by packing.

Aftertreatment consisted in the use of urotropin for its antiseptic effect upon the cerebro-spinal fluid and spraying the nose hourly with antiseptic oil spray. Nostrils were plugged with cotton in the intervals. The right eye was treated with 25 per cent argyrol.

Following the operation there was considerable œdema about the right eye, which cleared up in a few days, but no other untoward symptoms developed. Sutures were removed on the sixth day; skin union was primary. Drainage was discontinued after two weeks.

Patient was discharged to duty August 5. At this time the bone gaps were filled in with fibrous tissue. The right eye was distinctly lower than the left, probably due to the pressure of the overlying brain. Vision was normal and no signs of brain injury had appeared.

The difference in the level of the eyes is well shown in the photograph.

HYPERNEPHROMA OF RIGHT KIDNEY—NEPHRECTOMY WITH RECOVERY.

By Surg. A. M. Fauntleroy, United States Navy.

J. J., boatswain's mate, first class, United States Navy, white, aged 50 years, was admitted to the United States Naval Hospital, Philadelphia, June 28, 1910, with a diagnosis of hæmaturia. Case paper No. 195. Patient is married and has two healthy children. He does not use tobacco, has not touched alcohol for 15 years, and denies having had syphilis and gonorrhea. Apparently he escaped the diseases of childhood and does not remember being sick at any time till 1898, when he had an attack of ptomaine poisoning, at which time he was in a hospital for one month. While in Panama, nine years ago, he had an attack of malaria, lasting one week, but has had no further attacks. In 1900, while painting aboard ship, he fell a distance of 20 feet, striking his right side on a blacksmith's anvil. Dating from this injury there has always been a slight pain in the right loin.

In November, 1909, he first noticed blood in urine, and several paroxysmal attacks of pain in the right loin occurred at this time. One month after first attacks several attacks of hæmaturia with pain occurred in quick succession. On June 23, 1910, patient had a rather severe attack and stated that he was nauseated for the first time.

His grandfather and grandmother on both sides died of old age. Father died at age of 83 from injury, but had always been in good health. Patient's mother is living at the age of 83 and has always

been healthy. There are seven children in the family, of which four are living; one died in infancy, one died of pneumonia at the age of 10, and one died of typhoid fever at the age of 20. Patient states that there is no tuberculous or cancerous history in any of his connections.

On admission the right kidney is easily palpable and appears about three times as large as normal. Pain can be elicited on deep pressure in this region. Radiograph shows shadow of enlarged kidney and the absence of any calculi. With the indigo-carmine test and cystoscope the function of the right kidney is found to be suspended, and the left kidney is apparently normal. Patient has lost 10 pounds in the last six months, but appears well nourished and has a normal red and white count. Heart, lungs, and liver are normal, and fæces and sputum negative. Urine is of nearly normal amount (1,500 cubic centimeters), shows an occasional red cell with a faint trace of albumin, but no casts, and is negative to tests for sugar and tubercle bacilli.

A tentative diagnosis of hypernephroma was made for the following reasons, viz: The age of the patient was against the tumor being sarcoma, as was also its apparent slowness of growth. As there was no cachexia present, but, on the contrary, an apparently normal general condition with the exception of the kidney, cancer, though not ruled out, was considered improbable. The pain, when present, was always of a dull aching character and, though at times it became paroxysmal, it lacked the acuteness generally associated with renal colic or stone, was always localized in right loin, and was never referred to any distant part, such as groin or thigh. Though X-ray findings are at times fallacious in examination for the presence of a stone in the ureter or kidney an excellent radiograph was obtained and found to be negative for calculi so that, in connection with the other symptoms, a reasonable assurance was felt that no calculi were present. Hydronephrosis was not considered likely on account of the general lack of symptoms indicating obstruction, and there was no renal epithelium in the urine. The prostate was slightly enlarged but the cystoscope ruled out any bladder condition. The pain, when present, being not relieved by any particular position, such as lying down, and being more severe on deep pressure when the kidney could be distinctly palpated, a movable or floating kidney was not seriously considered. Tuberculosis of the kidney while possessing some prominent symptoms in common with hypernephroma, usually shows a certain amount of pus in the urine along with tubercle bacilli. There is also the strong probability of a primary focus elsewhere and the certainty of secondary extension to the bladder. The general health being considered, and the lack of the above conditions noted, tuberculosis was thought to be excluded.

YHPERNEPHROMA OF RIGHT KIDNEY. RESULT AFTER NEPHRECTOMY.

See page 169

Nephrectomy was decided upon and performed on July 13, 1910. Feeling certain that the kidney could not be delivered through the usual incision of Edebohls, the incision was made to pass downward and forward over the anterior superior spine. The fibers of the latissimus dorsi were bluntly separated and the lumbar fascia divided. On breaking up the fatty capsule the upper pole of the kidney was found to be firmly adherent to the posterior abdominal wall and to the ascending colon anteriorly. These adhesions were broken up by finger dissection, and the kidney was freed and delivered. The entire upper half of the viscus presented elevated nodular protuberances, each about the size of a walnut and of fairly firm consistence. The organ was about three times as large as normal, and, on section, appeared to be completely disorganized, except the lower third, which appeared to be macroscopically normal.

After removal a large cigarette drain was carried down behind the colon and the wound was sutured and dressed. Patient recovered very slowly from the ether, and on the day after the operation passed 850 cubic centimeters of urine having a faint trace of albumin. Plenty of water and a strictly milk diet were adhered to for 10 days, and the urine gradually increased in amount. For the first few days there was a very copious sanguineous discharge on the dressings, which gradually lessened, and the drain was correspondingly shortened every other day. Six weeks after operation the wound was entirely healed and the patient passing from 1,500 to 1,600 cubic centimeters of urine daily. Two months after operation he had gained 15 pounds and was apparently perfectly normal, stating that he weighed 5 pounds more than his normal weight. At present, three months after operation, patient states that he never felt better in his life, and he is to be returned to duty in a short time.

The photographs accompanying this paper show a section of the tumor kindly prepared for me by Surg. C. S. Butler, United States Navy, and the condition of the patient's right side after operation. Asst. Surg. E. E. Woodland, United States Navy, was associated with me throughout the management of the case, and it is to him that I am indebted for the cystoscopic and X-ray findings, and also for his attentive interest in everything that concerned the patient.

A CASE OF GENERAL CHRONIC PERIHEPATITIS.

By Surg. E. R. Stitt, United States Navy.

P. H., a water tender, aged 52 years, was admitted June 4, 1910, with a diagnosis of chronic hepatitis.

There was a history of occasional swelling of the legs for several years, this swelling subsiding during the night. Ascites began to

develop a few weeks before his admission to hospital. He was then tapped and 13 liters of fluid removed. There was at no time jaundice. When admitted to hospital there was some swelling of the legs and an enormously distended abdomen was noted. Patient had no digestive trouble, and felt very well except for the discomfort incident to the large amount of fluid in the abdomen. Urine, stool, and blood examinations were negative.

He was tapped, and 10 liters of fluid withdrawn. At this time his spleen was found to be barely palpable.

The fluid obtained from the first tapping showed a total proteid content of 0.6 per cent, of which one-third was nucleo-proteid. An interesting fact was that with subsequent tappings the fluid showed less and less nucleo-proteid until the fluid from the last few tappings showed a typical transudate character. The nitrogen eliminated as ammonia varied from 20 to 25 per cent of the total nitrogen at different estimations of the urinary nitrogen.

It was necessary to tap the patient every 10 days in order to make him comfortable. He seemed able to digest any food, and experienced very little epigastric discomfort until the abdomen had filled again. From 12 to 14 liters of fluid were removed at each tapping.

Death resulted from asthenia December 2, 1910.

At autopsy the heart was somewhat smaller than is usual, but perfectly normal. The spleen was but slightly enlarged and was covered by a dense fibrous capsule. Sections of the spleen showed a very thick fibrous capsule and thickening of the arterioles of the Malpighian corpuscles. There was no amyloid change.

The most striking feature of the autopsy was the profusion of anastomes. The omentum formed a thickened adherent mass incorporating the transverse colon and duodenum. From this mass arose a number of anastomotic branches going into the abdominal walls. Two of these were as large as the little finger.

The liver was not the greenish hobnailed liver we anticipated, but instead was smooth grayish white. It weighed 850 grams.

Sections from the liver showed a very thick and laminated capsule with fairly numerous aggregations of lymphoid cells beneath. Stained by Van Gieson's stain there was no increase of connective tissue except in the capsule and surrounding the structures of Glisson's capsule. The bile ducts stood out sharply by reason of the perfect nuclear staining in the contrasting thickened connective tissue surrounding them.

Very striking was the island-like arrangement of normal liver cells surrounded by areas showing marked fatty change.

It would seem that this case might be included in the group of cases of multiple serositis.

CASE OF BACILLARY DYSENTERY SHOWING EXTREME TOXÆMIA.

By Surg. E. R. Stitt, United States Navy.

S. O. L., a quartermaster sergeant, United States Marine Corps, was admitted November 25, 1910, with a history of having had a severe dysentery for five days prior to entering hospital. The number of stools had reached 60 in 24 hours.

Upon admission condition somewhat resembled that of a cholera patient, the hands being shrunken and nose pinched. There was some clouding of consciousness. On the day following there was collapse, from which he slowly recovered under treatment. The patient, however, became more and more stuporous, dying early in the morning of December 2.

The dysenteric stools failed to show amœbae. but an organism was isolated similar in every cultural characteristic to Shiga's bacillus, except that it produced a moderate amount of gas in glucose bouillon.

At autopsy the mucous membrane of the entire large intestine and of the lower 15 inches of the ileum was necrotic, and from the depths of this almost gangrenous mucosa an organism similar to that isolated from the stools was obtained in pure culture.

REPORT ON 10 CASES OF SYPHILIS TREATED WITH "606."

By Surg. U. R. Webb, United States Navy.

Early in October, 1910, Medical Director M. H. Simons, United States Navy, in command of United States Naval Hospital at Mare Island, Cal., through the courtesy of Capt. H. J. Nichols, United States Army, and Flexner, of the Rockefeller Institute, received for trial 10 doses of the Ehrlich-Hata preparation "606."

It was our desire to try this remedy in every stage and form of syphilis possible, and cases for treatment were selected with extreme care. None but those in whom the diagnosis was beyond any doubt received a dose. The Noguchi reaction was taken in each case, in some cases several times before treatment, and though all but one were negative, all but this one had been treated with mercury, most of them long and vigorously. The serum reaction in all is negative at present.

Three recent cases with unhealed primary and well-developed secondary lesions were treated. Infection in the others had existed some time, in one case probably for many years.

Four doses were administered in neutral suspension, as recommended by Wechselmann, and the remaining six in slightly alkaline solution by the method of Lesser. The amount of pain resulting, the area of induration and soreness, and the effect on the disease

seemed to be about the same in all cases and did not appear to depend upon the method of administration. We prefer the method of Lesser, as it is easier, more cleanly, and by it there is not the danger of losing part of the dose by the clogging of the needle. Both the Wechselmann and Lesser methods of preparation and administration are described below. We had no infection or abscess formation. In one case there was an area of necrosis about one-half inch in diameter at the site of puncture. In every case there developed a large area of induration, tender and red in most cases. Most of these areas have not yet entirely disappeared. Pain, but not of extreme severity, was complained of a few hours following the injection by all the patients; in fact nearly every one received morphia the first night.

Considering the limited number of cases we have treated and the short time that has elapsed since their treatment, we are willing to allow every claim made by Ehrlich for this wonderful remedy. We have had no unfavorable result in any case and none has failed to show marvelously rapid improvement. In fact one must see the results attained by this treatment to be properly impressed with its value. One of our cases shows symptoms of a beginning relapse, he received only a small dose (0.45 gram) and may need another.

Following is a short description of the cases:

Case 1.—E. D., aged 28 years, was admitted on August 24, 1910, with an erosive chancre, which had destroyed about one-third of his glans penis. This sore had appeared as a small papule on July 12, 1910, 22 days after exposure, and had grown slowly, but steadily. There were general glandular enlargement, mucous patches on the tonsils, and a faint macular eruption over chest, back, and abdomen. Vigorous treatment with mercury was instituted and persisted in until October 5, when the patient had reached the limit of his tolerance for this drug. The chancre was healed, but the mucous patches in his throat persisted and were growing worse. A large ulcer had appeared on his right thigh. Mercury was stopped. On October 14 his throat was much worse, swallowing was very painful, and the ulcer on his leg was larger. Noguchi reaction was negative. On this day he received 0.6 gram of the Ehrlich-Hata "606," it being prepared after the method of Wechselmann and injected in two parts, one at the angle of each scapula. There was quite a little pain during the night, requiring a quarter of a grain of morphia; however, the patient felt well in the morning and there was no further complaint. A large area of induration developed at the site of each injection, persisted for several weeks and slowly disappeared. On October 20 the lesions in his throat were entirely healed and the one on his leg was only half its former size. He was feeling well, eating and sleeping normally, and gaining rapidly in weight. On November 1 all his lesions were entirely healed and on November 26 he was discharged to duty, seeming well in every respect.

Case 2.—C. L. W., aged 28 years, was admitted to the hospital on August 12, 1910. He had been infected early in July and his case from the first was one of the utmost severity. The chancre was almost phagadenic in character and healed only after most vigorous treatment. Secondary symptoms appeared on July 25 and rapidly grew worse. These took the form of mucous patches and deep ulcers of the throat and mouth, and rupial ulcers over trunk and

Case 2. Before treatment with "606."

Same case two weeks after treatment.

SYPHILIS TREATED WITH "606."

See page 174.

Case 5. Before treatment with "606."

Same case after treatment.

SYPHILIS TREATED WITH "606."

See page 175.

limbs, most marked over tibiæ. Mercury was given intramuscularly, by inunction and by the mouth, with little effect in staying the progress of the disease. Iritis of the right eye developed late in August and progressed rapidly to destruction of vision in that eye, despite all treatment. On October 1 mercury was stopped. At this time the patient's condition was pitiable in the extreme and, indeed, seemed desperate. He was confined to his bed, emaciated, covered with sores, and not only blind but subject to intense pain in the right eye. He could not sleep and could swallow only liquids, and these with pain. From October 1 to October 10 he was treated with intramuscular injections of sodium cacodylate, with some improvement. On October 14 Noguchi reaction was negative. He received on this date 0.45 gram of "606," prepared and administered by the method noted above. The results in this case seemed almost miraculous. Within 48 hours his throat and mouth were so far improved that he could eat anything. His appetite became ravenous. By the 1st of November his mouth and throat were well, almost all of the skin lesions were healed, he had gained 19 pounds in weight, and all pain and acute symptoms of iritis were relieved. Of course the exudate persisted. At present, December 9, several of the healed lesions over his tibiæ are breaking down, he is losing weight, and seems to be relapsing.

Case 3.—C. H. C., aged 26 years, was admitted to hospital August 6, 1910. There was a history of a mental sore. Patient had a fading macular rash over trunk and limbs, general glandular enlargement, and mucous patches on the tonsils. He was quite emaciated and much reduced in strength. Vigorous treatment with mercury was instituted and continued until October 25. He gained considerably in weight and strength under this treatment, but the ulcers in his throat persisted and he developed a paronychia of right thumb. On November 2, 0.6 gram of "606" was given by the method mentioned above. Noguchi reaction at time of injection was negative. His improvement was rapid, and on December 1 he had gained markedly in weight, all his lesions were healed, and he was considered fit for duty.

Case 4.—R. E. McD., aged 21 years, was admitted to the hospital October 28, 1910. A chancre appeared early in August; exposure occurred early in July. A profuse macular eruption appeared on August 30; this was accompanied by the usual enlargement of the glands. Patient was treated with deep injections of bichlorid of mercury every fourth day. Despite this, on admission there were mucous patches and ulcerations on both tonsils and pillars of the fauces, as well as on the lips and hard palate. His general physical condition was excellent. He received 0.4 gram "606" on November 2. This was administered in slightly alkaline solution by Lesser's method. There was very little pain following this injection, but the same area of induration developed in this as in the other cases. This patient's mouth and throat were well and he was fit for duty within three days. He has had no return of the disease up to this time.

Case 5.—O. C. B., aged 36 years, was admitted to the hospital June 21, 1910. This patient does not know the date of the primary lesion, but thinks it may have been about six years ago. He has one brother and five sisters living. One brother, next older than he, died in infancy. Patient has a scar above the left knee, which he says is the site of a large, slow-healing ulcer with which he suffered when 11 years old. His left leg has always been somewhat smaller than the right and is about 1 inch shorter. This man has three children, the oldest of whom, a girl of 15 years, shows some of the stigmata of inherited lues. He was enlisted on November 3, 1907, and has spent the greater part of his time on the sick list since enlistment. He was under treatment in this hospital for tertiary syphilitic ulcers of the left leg from July 1, 1909, to February 14, 1910. During this time he was treated by inunctions and "mixed treatment." He was

discharged to duty "well" on the latter date. On June 21, 1910, he was readmitted, having stopped treatment, the ulcers had broken down and were worse than ever. All methods of treatment known to us were tried on these ulcers without improvement.

On November 1 his weight was 141 pounds, he had a pale, sallow, cachectic appearance, and was much reduced in strength. There was a deep ulcer on the left calf about 4 inches in diameter, having undermined edges, a sloughing base, and profuse discharge. There was another ulcer just above the left external malleolus almost encircling the leg, of the same character as the one above. The foot was very œdematous. The patient could walk only with crutches, and then with much difficulty and only a short distance.

Noguchi reaction was negative. On November 2 he received 0.35 gram of "606" by the method of Wechselmann. In a few days it was noted that his ulcers were healing very rapidly. On November 16 the upper lesion was healed and the lower was less than half its former size. He was able to walk without a cane. On December 1 he had gained 10 pounds in weight, and the lower lesion was practically well.

Case 6.—J. L. R., aged 29 years, was admitted to hospital on October 19, 1910, with both primary and secondary lesions. He had been taking mercury by the mouth for two weeks. Mercury was stopped. On November 1 Noguchi reaction was negative. On November 2, 0.45 gram of "606" was given by Lesser's method. Within a week all his lesions were healed and the rash had disappeared. He has remained well up to this writing.

Case 7.—E. J. K., aged 20 years, was readmitted to the hospital on October 28, 1910, with mucous patches in the throat and a large ulcer on the tongue. His weight was 125 pounds and he was much reduced in strength. Infection in this case occurred about February 15, 1910. The symptoms were severe from the onset, with a pustular secondary eruption that covered the whole body and much resembled true variola. He responded well to treatment, however, and was discharged to duty on July 8, 1910. On November 2, 0.45 gram of "606" was given by the method of Lesser. Improvement was wonderfully rapid in this case. At the end of one week all lesions were healed and the patient had gained 9 pounds in weight. At present his weight is 150 pounds, a gain of 25 pounds in one month.

Case 8.—W. F. S., aged 23 years, was admitted to hospital on August 14, 1910, and treated until October 15 for indefinite symptoms consisting of progressive loss of weight and strength, irregular fever, and pains in the bones and joints. During October he developed several large rupial ulcers on his back and arms. He received no mercurial treatment. On November 9 Noguchi reaction was strongly positive.

On November 12, 0.50 gram of "606" was given by Lesser's method. On November 17 his rupia had healed and the scabs fallen off; he had gained 7 pounds in weight. On December 1 he had gained 13 pounds in weight. All his lesions are healed and he looks and feels like a new man.

Case 9.—C. B. S., aged 28 years, was admitted to the hospital on June 14, 1910, having been infected during May, 1910. On admission he was suffering with the usual secondary lesions, and in addition seemed to have some laryngeal involvement as evidenced by hoarseness and a dry cough. Although resistant, all his lesions finally yielded to mercury except his laryngitis. This was progressive, and patient could not speak above a whisper from July, and was much troubled by cough. Sputum was very scanty; repeated examinations for tubercle bacilli were negative. On November 12, 0.50 gram of "606" was given by Lesser's method at noon. Patient became unconscious immediately but was quickly revived and put to bed. At 2 p. m. respirations were 44, pulse

Syphilis treated with "606."

CASE 8. IODINE STAINS NEAR RUPIA SHOW AREAS OF INDURATION AT SITE OF INTRAMUSCULAR INJECTION.

See page 176.

55, and temperature of 97° F. After several hours and free stimulation he reacted, however, and spent a fairly comfortable night. There was quite a febrile reaction for several days, his temperature going as high as 101° F.

On November 17 his lungs were clear, his hoarseness had disappeared, and he was able to speak again for the first time in five months. He now seems entirely cured.

Case 10.—W. J. K., aged 33 years, was admitted to hospital on June 6, 1910, having been infected in April. The primary sore was followed by the usual secondary lesions, macular rash, and mucous patches. His rash soon faded under treatment, but the mucous patches persisted and loss of weight and strength were rapid and progressive. On August 15 he was confined to bed by weakness, anorexia, insomnia, and headache of extreme severity. Signs of meningeal involvement were marked for several weeks, but gradually improved under mercury pushed to the limit. About this time, however, mercurial treatment had to be discontinued, as his teeth were becoming sore and loose. When the mercury was stopped his mucous patches would recur. This was his condition about the 1st of November. It seemed that he had to be kept half salivated to be rid of his open lesions. Forty-five hundredths gram of "606" was given on November 10, by Lesser's method. Patient ran an irregular febrile temperature, 100° F. to 102° F., for several days, but soon began to feel better and was discharged to duty cured on December 6.

Wechselmann's technique.—Wechselmann's method of preparation and administration of "606" is described as follows:

Dioxydiamidoarsenobenzol is dissolved by triturating in a mortar in from 1 to 2 cubic centimeters of a soda solution, when, by adding acetic acid in drops, a fine yellow paste is precipitated. This precipitate is then made sterile and dissolved in from 1 to 2 cubic centimeters of distilled water, and neutralized by the addition of 0.1 normal soda solution or 1 per cent acetic acid. The reaction is very carefully ascertained with litmus paper. The absence of pain depends upon the exactness of this neutralization. The deposit is centrifugalized and the paste which has been deposited at the bottom of the glass is shaken up with a physiological sodium chloride solution. This mixture is drawn into the syringe and slowly injected subcutaneously below the shoulder blade in a place which has been made aseptic and treated with tincture of iodine.

Lesser's method.—The following is a brief description of the technique employed by Lesser in preparing "606" for injection:

Into a glass cylinder having a capacity of 25 to 30 cubic centimeters, and a ground glass stopper, shake out the contents of the capsule of "606" salt. Immediately add 15 cubic centimeters of hot sterile water. Shake until thoroughly dissolved. In order to facilitate the solution of the salt it is well to have half a dozen glass pearls in the jar.

When solution is complete add 2 cubic centimeters of a decinormal NaOH solution and shake again. The contents of the jar immediately become somewhat coagulated. Add more NaOH solution drop by drop, shaking all the time, until the solution becomes clear. The

solution should now be neutral; practically it is always slightly alkaline. Make up to 20 cubic centimeters and inject deeply into buttocks or at the angle of the scapula.

We have injected in two parts at the angle of the scapula in all cases.

Of course in each of the above methods of preparation and administration every article used should be sterilized as thoroughly, and every precaution taken, as for a surgical operation.

A SUSPECTED CASE OF GANGOSA.

By Passed Asst. Surg. O. J. MINK, United States Navy.

The patient came to the laboratory asking if a previous diagnosis of gangosa could be confirmed.

There is a history of syphilis eight years ago, and examination showed a perforation of the hard palate and some destruction of the nasal septum. The complement fixation test was positive. Bacteriologically an unidentified spore bearer, a *staphylococcus pyogenes albus* and a *staphylococcus pyogenes aureus* were found. A fourth organism also was present. It was a Gram positive, nonacid-fast, distinctly branched organism which failed to stain characteristically with Neisser's stain. Smears directly from the throat showed bipolar dots with Loeffler's alkaline methylene blue. These bipolar dots disappeared after the second or third generation on media, although an occasional dot persisted. Broth cultures injected subcutaneously into guinea pigs produced no lesion other than a moderate swelling, which gradually disappeared. This organism is a corynebacterium evidently belonging to the large and poorly defined pseudodiphtheria group. The patient states that the same organism was isolated from his nose in 1908 on several occasions.

From the findings there seems no reason for any diagnosis other than syphilis, although the local ulceration is undoubtedly kept active by the nasal bacteria.

LAMBLIA INTESTINALIS AND ASCARIS LUMBRICOIDES ASSOCIATED WITH AMŒBIC DYSENTERY.

By Passed Asst. Surg. G. B. TRIBLE, United States Navy.

J. P. McG., private marine, aged 27 years, had no settled occupation previous to enlistment in the Marine Corps. He was first admitted as a patient on the U. S. S. *Relief*, March 23, 1909. At that time he had malaria, the parasite of tertian malaria being found in his blood. As the blood showed an eosinophilia, an examination of

his stools was made. The result of examination of stools at time of admission was negative. About one week after admission he complained of pain and tenderness over abdomen and that he had diarrhea. Examination of stools showed ova of *ascaris lumbricoides*. No amœbæ. Two grains of santonin, preceded and followed by a saline cathartic, were given as a vermifuge. No worms were passed, but symptoms ceased, and the patient was soon discharged to duty.

He was again admitted, August 5, 1909, with diagnosis of acute intestinal catarrh, complaining of nausea, pain and tenderness over entire abdomen, and much blood in stools. Examination of stools showed no amœbæ, much free blood, and many ova of *ascaris lumbricoides*. Having abstained from food for 18 hours, he was given 3 grains of santonin, preceded and followed by a saline cathartic. One female ascaris was passed. The movements decreased in number from 15 to 4 daily. Five days later ova reappeared in the stools. Fasting and vermifuge were repeated No worms were passed, but symptoms disappeared, and the patient was discharged to duty.

On September 14 this patient was readmitted with diagnosis of dysenteria. He had been doing duty for nearly one month. Patient was much thinner than formerly, his blood was negative, and the urine was negative throughout. His chief complaint was abdominal pain, coupled with the passage of almost pure blood. Microscopical examination of stools showed many blood cells, no ova, no amœbæ or other parasites.

Symptoms continued and examination with sigmoidoscope was made, numerous shallow apparently clean ulcers were seen, about 6 to 9 inches above the anus; these bled easily and freely. Other ulcers were undoubtedly higher, but owing to pain a complete examination could not be tolerated by the patient. No amœbæ or ova were found in the ulcers. Irrigations of silver nitrate 1–10000 were prescribed. The bowels were placed at rest with bismuth and opium and improvement took place for a period of four or five days. On September 27 a recurrence of all symptoms took place; examination of feces showed many amœbæ and thousands of *lamblia intestinalis*. No ova were found in this or in subsequent examinations. Treatment was changed to quinine irrigations per rectum, but these were not as efficient in checking the diarrhea as the silver nitrate or as zinc sulphate, which was used instead of the silver for a time. The bismuth was given in addition, but seemed to have no effect except a psychic one. This patient made no permanent improvement and was finally invalided to the United States. The ulcerations continued about the same; local treatment was discontinued on account of the pain and bleeding.

In this case the infection by *ascaris lumbricoides*, while not dangerous in itself, left the intestinal tract of this patient in such a state that he readily became infected by the amœbæ and the flagellates.

A CASE OF PERNICIOUS ANEMIA SHOWING POINTS OF RESEMBLANCE TO KALA AZAR.

By Surg. E. R. Stitt, United States Navy.

Ali Rama, supernumerary, native of India, was admitted to hospital with extreme anemia and enlargement of the spleen on September 26, 1910. Blood examination showed 850,000 red cells and 1,200 leucocytes, with a reduction of the polymorphonuclear percentage to below 50 per cent. Hæmoglobin ranged from 20 to 30 per cent. Liver not enlarged. Splenic puncture failed to show Leishmania-Donovan bodies in smears, and cultures in sodium citrate were negative. A few days before death, which occurred on October 11, hemorrhages took place from gums, intestines, etc., and petechial spots appeared over body surface. The blood for the first time showed rarely a megaloblast—macrocytes, however, had been present from the first.

Autopsy showed subcutaneous fat of a deep lemon-yellow color. Stomach and intestines dotted with hemorrhagic spots. Viscera generally showed fatty change. Bone marrow from femur was red and many megaloblasts were found in it.

CASE OF AMŒBIC DYSENTERY WITH LIVER ABSCESS.

By Surg. E. R. Stitt, United States Navy.

Tong Kang Yung, a supernumerary, was admitted to hospital October 13 in an almost moribund condition from amœbic dysentery, there being a question as to the advisability of an appendicostomy. Patient died 36 hours after admission.

Autopsy showed a perforated ulcer of lower portion of ascending colon, with numerous ulcerations and necrotic areas along entire course of large intestine. An interesting point was that the sigmoid flexure swept across to right iliac region to cover and be adherent to lower end of cæcum, thence turning toward central line to terminate in the rectum.

This anomalous condition would have made an appendicostomy or cæcostomy very difficult and, considering the adhesions and necrotic condition of the large intestines, impracticable.

A solitary abscess the size of a large walnut was found in the liver, the walls of which, when sectioned, showed amœbæ. Cultures from intestinal ulcerations and liver abscess were negative for amœbæ.

CASE OF INTUSSUSCEPTION.

By Surg. E. R. STITT, United States Navy.

A Filipino, aged 37 years, was admitted to hospital November 6, with a history of having been sick with "stomach trouble" for a period of one month and of having suffered acute pain in right iliac region for the three days preceding his admission to hospital. There was history of constipation for several days, and he stated that the last bowel movement had the character of "dark mud." Nausea and vomiting were also complained of.

Upon examination a large, slightly movable mass was found in lower right quadrant, with slight rigidity of right rectus. Patient at the time was almost moribund, having a thready pulse. He was operated on by Surg. Curl immediately, and upon opening the abdomen a large hard mass was found in cæcum and ascending colon. An incision was made into the cæcum and a gangrenous adherent coil of intestine resected. Intravenous infusions were necessitated twice while patient was on the table. Mixter tubes were introduced into the cæcum and end of ileum and the original opening into cæcum closed. In delivering the gangrenous mass great numbers of whipworms were seen everywhere, and many of them escaped into the peritoneal cavity. Under proctoclysis patient improved for a few days, but died on November 19, 1910.

The leucocyte count persistently remained about normal; no reaction.

Autopsy showed right lung studded with miliary tubercles, and the same condition in left lung, but in lesser degree.

Liver normal. Kidneys cystic.

The lower end of ileum as well as cæcum was found to be gangrenous. Dirty grey sloughs of all tissues were found in region of site of operation.

Distributed generally between the more or less adherent coils of intestine were numerous accumulations of pus, the purulent contents varving in different pockets from thin curdy to material of creamy consistence.

Cultures only showed the presence of *B. coli* and *B. pyocyaneus*.

REPORT OF TWO UNUSUAL FRACTURE CASES.

By Surg. J. B. DENNIS and Asst. Surg. A. C. STANLEY, United States Navy.

Fracture of inferior maxilla (indirect violence).—In September, 1909, D. M., ordinary seaman, was brought to the sick bay with the following history: While working near a boat he lost his balance

and fell over the side, striking the right side of his head on a boom, and then fell to the water, was rescued and brought to sick bay, and examination showed the right side of face contused and greatly swollen; the inferior maxillary was intact on this side, while on the left side the bone was fractured between the last molar tooth and the angle of the jaw; the ramus was freely movable and displaced outward; by manipulation the upper fragment was placed in position and external splints applied; patient was put to bed and oral cavity treated with antiseptic solutions, and at the expiration of 14 days patient returned to duty, and examination since discharge showed good approximation and no ill effects.

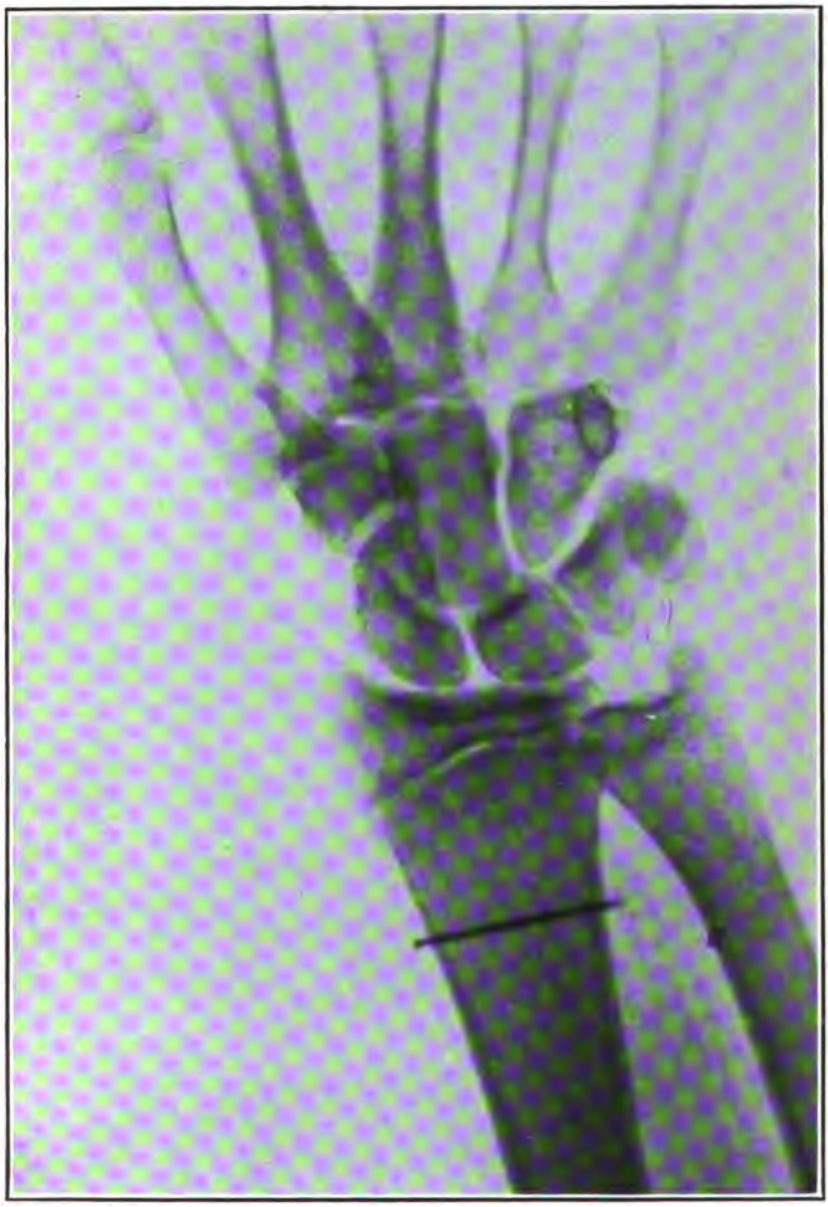
Fracture of ulna and radius of both forearms.—On November 29, 1909, F. E. A., ordinary seaman, while coaling ship lost his balance and fell between ship's side and coal barge. In falling, his forearms were thrown up over his head for protection, consequently his forearms received the brunt of the fall and, when examined at sick bay, a complete fracture of the ulna and radius of both forearms, 1 inch above the styloid process was detected; the deformity of the left arm was slight, while in the right the anterior and lateral ligaments of the wrist joint were so torn that the deformity was more marked. The bones of the hand forming the articulations were dislocated. The fractures were reduced and long splints applied, covering in the dorsum of the hand, while the internal splints only reached to the palms. The patient was kept quiet, and three days later, through the kindness of Passed Asst. Surg. Warner, United States Navy, a skiagraph was taken, with the result shown in accompanying picture. On the fifth day the arms were incased in plaster, and so remained until the twenty-first day, when the plaster was removed and passive motion of wrists encouraged. The man was discharged in the fifth week and recommended for light duty. The result in the left arm is perfect in so far as its use is concerned, while the right, this being the one more seriously injured, is at times painful; the general result is very gratifying. The fracture is a most unusual one.

ASSOCIATED TUBERCULOSIS AND SYPHILIS.

By Passed Asst. Surgs. O. J. MINK and E. H. H. OLD, United States Navy.

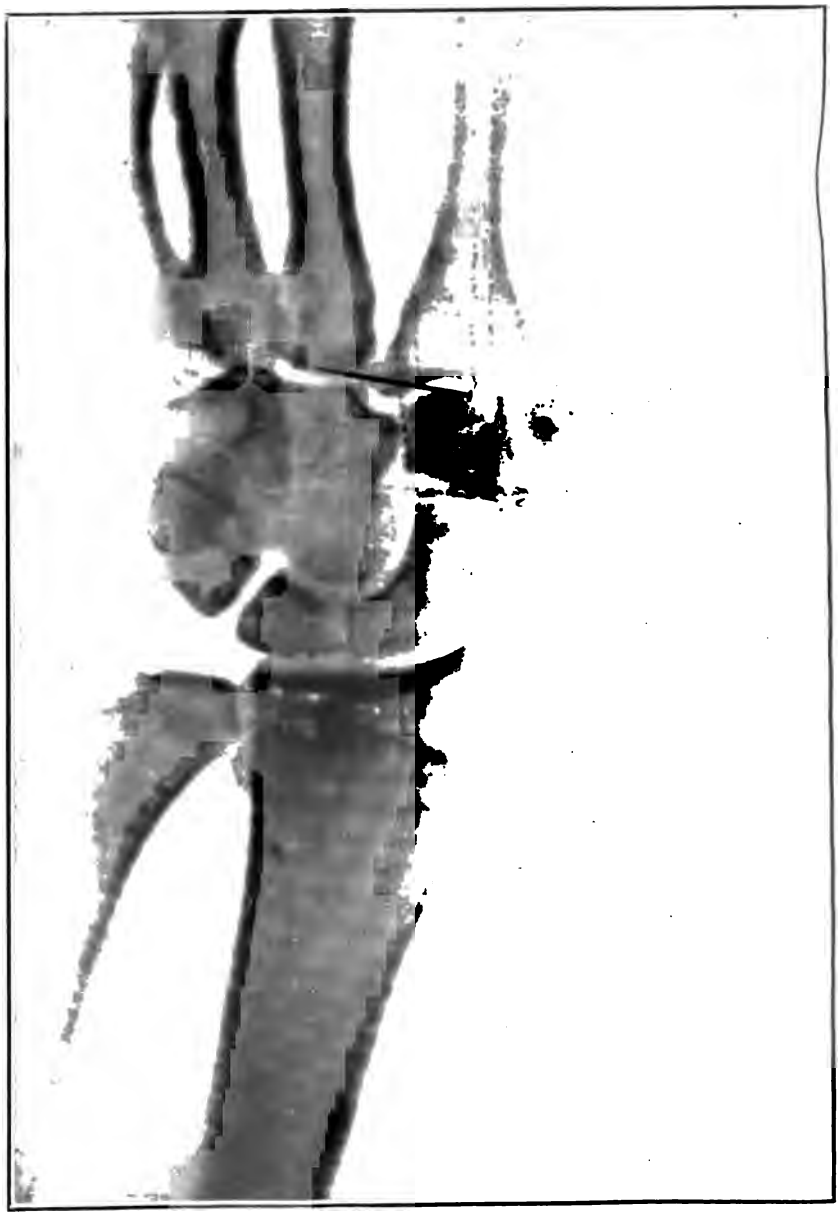
The patient was transferred to the hospital with a diagnosis of tuberculosis of the lower end of the sternum, there being necrosis of the sternum and a mass of granulation tissue present.

He also complained of marked falling out of hair and eyebrows. The tongue showed a marked enlargement and furrowing. Syphilis was denied and there was no evidence of any lesion.



FRACTURE OF ULNA AND RADIUS OF BOTH FOREARMS—RIGHT FOREARM.

See page 182.



FRACTURE OF ULNA AND RADIUS OF BOTH FOREARMS—LEFT FOREARM.

See page 182.

The Wasserman reaction was markedly positive. Some improvement resulted from the use of antisyphilitic treatment, especially in stopping the alopecia. Scrapings from the lesion in the sternum caused the death of a guinea pig, with lesions of tuberculosis, and the tubercle bacillus was demonstrated.

This case illustrates the importance of bearing in mind that, although a positive Wasserman indicates syphilis, it does not mean the absence of other diseases, as the lesion in this case was thought possibly a gumma until demonstrated otherwise.

AN UNDESIRABLE RECRUIT.

By Passed Asst. Surg. HEBER BUTTS, United States Navy.

The following case would seem to indicate the desirability of inquiring somewhat into the family history and past record of candidates for enlistment. As a character study it shows the utter inability of some unfortunate individuals to adapt themselves to any environment. A mere glance down the long vista of this man's career of failures before he appeared at the recruiting station should make it apparent to any medical or line officer that it would be far easier for the proverbial camel to go through the needle's eye than it would be for this man to adapt himself to the environment which the naval service offers.

P. E., coal passer, United States Navy, age 29 years. Enlisted at Los Angeles, Cal., July 25, 1910. Admitted to the Government Hospital for the Insane December 3, 1910. Diagnosis, paranoia (semi-imbecility); origin not in line of duty; existed prior to enlistment.

Family history.—Patient has no definite knowledge of his grandparents and does not know whether they are living or not. His 76-year-old father is addicted to the excessive use of alcohol and has been drunk a great many times. His mother died when he was 3 or 4 months old. Her age and the cause of her death are unknown. His father was married three times. One stepmother is dead; cause and age unknown. The condition of his second stepmother's health is unknown. Three supposedly healthy brothers are living, but their whereabouts are unknown, except one brother, an electrician, who lives in Knoxville, Tenn. Three married sisters are living and in good health. All of them have healthy children. He has several stepbrothers and sisters, but he does not know their names, their number, or condition of health.

Personal history.—Patient was born September 3, 1881, at Ashtabula, Ohio. When he was quite young his father, a shipowner, took him to a great many parts of the world, including Norway, Sweden, Russia, Germany, Italy, India, and Australia. He accompanied his father in this way until he was 8 years old. His father traveled in company with a woman who, he supposed, was his stepmother. He knows very little about his parent's habits.

He denies having had any of the diseases of childhood or venereal diseases. He says he is too clever to have venereal disease, because he always makes it a point to pay a prostitute to tell him whether she has any disease before ex-

posing himself. He gives a history of frequent sexual excesses, including masturbation, since an early age. These excesses have often been accomplished in a perverted manner, but he has never resorted to bestiality.

He says he has indulged in the excessive use of alcoholic liquors, chiefly in the form of whisky, all his life and has frequently been drunk. He also chews an excessive amount of tobacco each day. Drug addiction is denied, but he says he has often wished he had an opportunity to "see how it would go to hit the (opium) pipe. I am a great fellow for adventures; I like to try a little of everything."

At the age of 8 years his father placed him in an orphans' home, where he remained for four or five years, when he was transferred to a reform school because he stole a watch. He claims to have gone through the grammar school and to have spent a short time attending high school. He is, however, very ignorant, and it is very doubtful if he ever had much opportunity for intellectual improvement. He does not remember how old he was when he left high school. He says he studied "United States money, geography, grammar, physiology, drawing maps, history of United States and other countries, and latitude and longitude." He was a poor student and generally stood near the foot of his class at school, though he claims never to have failed of promotion; says he was very mischievous at school and used to throw paper wads at his teacher, drew caricatures of her on a slate, and had "all kinds of fun." He says his childhood days were very unhappy on account of the cruel treatment he received at the hands of his stepmother, who used to beat him unmercifully with barrel staves and stove pokers.

Until he was 16 years old he made two or three trips to the reform school. Then he began to "roam around the country." He does not remember where he went to first, but says he has been from one end of the United States to the other. He "pretty nearly always bummed" his way on the railroads, and on several occasions has shipped as a stowaway on ocean steamship liners, plying between this country and England. He does not know how many thousand miles he has beat his way on railroads, but knows it has been a great many. He has done "principally odd jobs" all his life, and has worked at oyster dredging, in wheat, cotton, tobacco, and corn fields, picked strawberries, oranges, figs, and cantaloupes, worked on thrashing machines, in hard and soft coal mines, in lead mines, and grubbed out tree stumps. He has never worked more than six months for any one man. He is unable to give a consecutive account of the jobs of work in which he has been engaged. He has often been idle for periods of several months at a time. He has made several trips as a "deck hand" on different lake steamers on all of the Great Lakes. He made two or three trips as a "cattle feeder" on a cattle ship bound for Glasgow, Scotland, from the United States. On another occasion during the Boer War he made a trip as "feeder" from Liverpool to Capetown, on the *City of Rome* with a cargo of mules.

When he was 17 or 18 years old he fell about 15 feet from a cliff to some rocks below, sustaining an injury to his left knee joint, which incapacitated him for walking without crutches for at least two months. His knee joint is now in a condition of *genu recurvatum*, and contains a "*gelenkmaus*," which can easily be felt on palpation. He says he is unable to run, but he can walk fast, and it would be useless for him to attempt to run away from a policeman.

About 8 or 10 years ago while "roaming around the country," with a "bull dog" revolver he shot at a man, who, he claims, called him a bad name. For this offense he was arrested, tried on the charge of "assault with intent to kill," and was sentenced to a term of from 1 to 19 years in the State penitentiary at Chester, Ill. After serving about two years, his sentence was remitted and

his liberty was restored to him. Prior to this difficulty he had been arrested on three or four different occasions for vagrancy and was put to work on stone piles for periods varying from three to four days. He also spent about 60 days in the Cleveland, Ohio, workhouse, but he does not remember why he was sent there.

While in the penitentiary at Chester, Ill., he claims he was treated very harshly, and was repeatedly handcuffed and beaten over the head with a club. He was frequently required to stand in one position from early morning till late at night. He says he was considered "a hard nut" and very stubborn by the prison authorities, but he claims in reality he was not stubborn, but could not understand what they wanted him to do. He says he had an attack of heat prostration while in the penitentiary, and during this attack he was shot in the left leg with a .44 caliber revolver by a penitentiary guard, who thought he was going to make an assault on him. The bullet passed through the fleshy portion of the leg, but did not fracture it.

He has led a nomadic existence ever since his discharge from the penitentiary, beating his way on railroads and ocean-going steamships. In this way he has beat his way from Boston to China and Japan, via Cape Horn and Vancouver, British Columbia, on full-rigged ships, brigs, and barks. He has usually been caught within a short time after putting out to sea, and has been made to work his passage.

A short time before enlisting in the Navy he went to Chicago, Ill., and entered the employ of a railroad contractor to work for him in Kansas City, Mo. He was given a ticket to Kansas City, on the payment of $2, but he did not do any work after he arrived there. Instead, he entered the employ of another railroad contractor, and upon the payment of another $2 was given a ticket to Belmont, Ariz. He worked 55 days at Belmont, helping to grade a railroad.

He then went to Los Angeles, Cal., and after working for about three months at various odd jobs, he enlisted as coal passer in the Navy "in order to make a man of himself" and with the hope (?) that the service "would straighten him up." He had read and had been told that in the Navy he would always be well cared for, clothed, and fed, a most important desideratum with him.

Present illness.—Patient states that his present trouble began at the recruiting station, where he swore falsely that he had never been in a penitentiary, reform school, or workhouse. He says he has had trouble ever since. Immediately after enlistment he, with two other recruits, was directed to report for duty at the navy yard, Mare Island, Cal. In some way or other he wandered away from his companions and reported for duty at Goat Island instead. After about two weeks at Goat Island he was transferred to Mare Island. He volunteers the information that at both Goat Island and Mare Island he got into minor difficulties with his superiors because of his stupidity and failure to comprehend what was required of him. While at Mare Island a master-at-arms, who had been a long time in the naval service, told him that he was too excitable for the service, and he did not think the patient would ever be able to make a cruise, as he could foresee that the patient was almost certain to get into trouble.

About three weeks after enlistment he was transferred to the U. S. S. *Washington*. About 10 days after his transfer to the *Washington* he was given a summary court-martial for refusing duty and was sentenced to lose his first month's pay. He thinks that the crew of the section of the ship in which he was so unfortunate as to be placed "had it in for him from the very first" and they did everything in their power to make life unpleasant for him. A few days later he got into trouble with the junior medical officer of the ship, and charges and specifications were preferred against him for using profane

and abusive language toward his superior officer. He says the surgeon became very angry with him because he was so stupid, and the patient also lost control of his temper and cursed the surgeon. He says the surgeon told him he would have him sent to prison for five years, but that the charges and specifications which were preferred against him were withdrawn because "the Lord knew that Pat did not deserve such severe punishment." He is very certain that the Lord prevented him from getting a general court-martial by controlling the actions of the officers on the ship. He knew that he was not a bad fellow at heart, but He permitted the patient to be punished as much as he was just to show him that there is a God, and that he should receive a certain amount of punishment for swearing to the lies he did when he enlisted in the Navy. He says he did not actually hear the Lord say these things, but he "felt inwardly" that it could not have happened any other way. Patient says he has always been very religious and has read his Bible a great deal, becoming interested in it while in the penitentiary at Chester, Ill.

The patient next got into trouble with a chief water tender on the U. S. S. *Washington* because of his refusal to shovel coal when he was tired. As a result he was called to the mast and sentenced to five days in the brig on full rations. Because he was given full rations he thinks his shipmates became jealous of him, and they continued to make his life miserable.

While in the brig awaiting court-martial he got into trouble with a hospital steward and a hospital apprentice. He says he was obstinately constipated and he could not get the surgeon to give him sufficient medicine, although he repeatedly told him his condition. One day the hospital apprentice brought him a dose of salts, but he used such insulting language in giving it to him that he again lost his temper and threw the salts on the deck. The next day he went to the sick bay, and the hospital steward, under the surgeon's direction, gave him a very large dose of castor oil. As a result of this dose he suffered severe cramps of his abdominal walls, and he thinks his abdomen has been sunk in ever since. He claims this "crimp" is present now and the entire lower portion of his abdomen "feels heavy," while the upper portion of his abdomen is "light."

In the latter part of November, 1910, he was transferred to the naval hospital, Norfolk, Va., where he remained about two weeks. During his short stay at the naval hospital he succeeded in getting into trouble with the hospital apprentice, who, he claims, attempted to "boss him around." He says he was "called to the mast" at the hospital, but the commanding officer, after due investigation of the case, reprimanded the hospital apprentice for his officiousness and did not punish the patient.

A synopsis of his hospital tickets from the U. S. S. *Washington* and the naval hospital at Norfolk gives the following information:

"Disease, paranoia (semi-imbecility), existed prior to enlistment. There is no evidence that the condition originated in line of duty. Condition is one of mental incompetency, which has gradually become worse. Patient has repeatedly refused to obey orders from his superior officers, and constantly declares that he is being treated unjustly and that everyone is trying to impose upon him. * * * The patient has been a professional "hobo," according to his own statements, with no settled occupation. * * * At present he has marked delusions, one that his abdomen has sunk in, following a dose of castor oil. He also has delusions of persecution. When questioned as to his sexual habits he illustrated the act of masturbation. He has shown no violence, but refuses to do any work; * * * was surveyed September 15, 1910, and recommended for discharge from the service, but upon the recommendation of the fleet sur-

geon of the United States Pacific Fleet he was retained on board until the arrival of the U. S. S. *Washington* in the vicinity of the Norfolk hospital."

His physical examination is negative, except for the following physical defects, which, irrespective of his mental condition, should have warranted his rejection at the recruiting station: (1) He has "flatfoot," the deformity being more pronounced in the left foot. (2) He stutters. He claims his physiological defect has existed since early childhood. It is easily brought out by the repetition of a few test phrases. (3) Both knee joints are hyperextensible, the left knee joint being really in a condition of *genu recurvatum*. (4) The left knee joint contains a "*gelenkmaus*," or "joint mouse," which can easily be felt on palpation, and which incapacitates him for running, although he can walk rapidly. He has a slouchy, shuffling gait.

Mental examination.—He is fully oriented, and his general memory is fair for the principal events of his life, but very poor for school-day knowledge. He is unable to give a connected account of himself. He lacks insight—says there is nothing the matter with his mind and that the Lord is responsible for his present plight. The Lord has been punishing him ever since he entered the naval service because of his offense "against the Holy Bible in swearing to a lie" about never having been in a workhouse, reform school, or penitentiary. He is resigned to his fate, however, and is willing to take any further punishment that the Lord may have in store for him. When his punishment is finished, he intends to lead an upright, moral life. In the narration of his story he frequently becomes lachrymose and between sobs describes the ill treatment received from his stepmother in his childhood days and from the different people with whom he has been associated. His thought is very shallow and limited mostly to his daily experiences. He seems never to consider the consequences of his actions either in reference to himself or others. His life story is very clumsily told, and, owing to his contradictions, omissions, and changes, is difficult to record. His consciousness is unclouded. It is quite impossible to harmonize his state of dense ignorance of school knowledge with his statement that he has been a student in high school. When asked how many 7×6 are, he gave the following reply: "Oh, I never did know the multiplication table much. I can not figure it without a pencil and paper. I never was much of a hand to sit down and figure." When asked how many are 3×4, he said: "The only way I can find that is to start from—— Oh! Three 4's are 12." Requests for answers to other arithmetical problems of similar difficulty met with similar responses.

When asked to give his idea of the difference between right and wrong, he gave the following characteristic answer of an imbecile: "Oh, I know all right, but I just can't explain. Why, wrong means to do anything you know is wrong, and right means to do anything you know is right."

He is quite stupid in both appearance and manner. He frequently gives careless and contradictory answers to questions, but this condition is believed to be more the result of his mental enfeeblement than a willful attempt to deceive. He is quick tempered and always wants to have his own way in doing anything, but with a little tact and flattery he is easily managed. Hallucinations can not be elicited. Emotionally he is quite indifferent and says he does not care what becomes of him. About the only thing in life that really seems to interest him is his physical well-being from day to day. He has apparently never had any ambition to rise above a mere existence. He is quite satisfied, and even pleased, with his care and treatment at this hospital. When asked for an explanation as to why he wept when talking about himself, he replied that he frequently feels "bad" (depressed) about his past wrongs, and that he is "very chicken-hearted" and is unable to see anybody suffering without cry-

ing himself. "I can cry any time I want to, and I have been this way all my life." He says he is a good worker on a farm and can shuck 70 or 80 bushels of corn per diem. "I like farm work because I can be my own boss on a farm. When the Lord is through punishing me, I am going to get a job of work on some farm in the Southern States. The southern people always treated me well, even when I told them I was a jailbird, but the northern people always treated me like a dog."

COMMENTS.—Here we have a young man who has, like the fiddler, "received more kicks than ha'pence." He has undoubtedly been feeble-minded from birth. He has been the football of chance and fate. His case presents a number of interesting features for naval surgeons.

In the first place, a mistake in diagnosis has been made in so far as that diagnosis relates to "paranoia." This patient is an imbecile. The points in favor of a diagnosis of imbecility are as follows: His life has been a career of failures, frequently punctuated by trips to reform schools, workhouses, and penitentiary; his utter lack of any ambition beyond a mere existence; his roving character; his paucity of ideas and defective reasoning and judgment; his inability to adapt himself to any environment since his earliest youth; his failure to remember scarcely any of his school-day knowledge; his obtuseness and stupidity; his great credulity, as evidenced in his dealings with prostitutes; his indulgence in sexual improprieties; his defective moral sense; his utter failure to consider the consequences of his actions; his refractory nature, manifested in stubborness and insubordination; and his apparent utter lack of any continuity of thought or singleness of purpose.

So far as I am aware, paranoia never develops on a basis of imbecility. An imbecile has not sufficient character or singleness of purpose to develop the very well systematized delusion covering a period of years which is so necessary a factor in making a diagnosis of true paranoia. Paranoia requires for its development an individual who has been capable of considerable intellectual development in some direction or another. As Tanzi well says, "The paranoiac is not always a man of action, but he is a man of character." The paranoiac is never stupid or silly, his thought is not shallow, and he does not change his mind from day to day as does an imbecile, but he builds his delusions into a coherent system, and this system is projected several years into his past life. An imbecile never has a systematized delusion, and it is doubtful if he ever has a fixed delusion for any considerable length of time. Paranoia is a comparatively rare disease.

Of perhaps more importance than a diagnosis in this case is a consideration of those factors in this patient's past history and mental examination which would enable a recruiting officer to reject candidates of this type for enlistment.

In the first place, the very obvious fact that this patient was unable to give a good, connected account of himself up to the moment he appeared at the recruiting station is sufficient evidence upon which to reject him. A man whose memory is so poor and whose interest in himself is so slight as to cause him to be unable to give a good account of himself has a defective mental organization, and should not be enlisted for any rating.

The next count in the indictment against him is to be found in his admission that he is a masturbator and sexual pervert. The boastfulness and great credulity which he exhibits in his voluntary description of his method of avoiding venereal infection are further evidence of a defective mentality, in addition to his defective moral sense.

The alcoholic history which he gives should be a cause for his rejection.

The fact that he has been an inmate of a reform school should be sufficient cause in itself for his rejection, and the same remark applies to his commitment to the penitentiary and workhouse. Of course it is to be remembered that he misrepresented the facts in connection with this portion of his life, but in a person of his type of defective mentality I feel sure it would have been quite easy to detect his fabrications by the most ordinary cross-examination. Failure to tell the truth should be a cause for rejection. Commitments to reform schools, penitentiaries, and workhouses bespeak inefficiency, degeneracy, criminal instincts, or vagrancy, either separately or all combined.

The fact that he made poor progress at school is at least fair evidence of a defective mentality. The fact that he is able to remember scarcely any school-day knowledge is proof positive of one or two things—he is either telling a falsehood when he states he has been a high-school student, or else he is greatly demented and has really forgotten his school-day knowledge. In either case, the evidence is overwhelmingly sufficient to reject him for enlistment. An alleged high-school student who is unable to correctly multiply 6 by 7 is mentally defective.

A history of an unhappy childhood is at least prima facie evidence of an individual poorly bred and poorly born. A poor start in life of course does not necessarily mean a poor end, but environment, especially in the period of childhood and youth, is a most powerful factor in the determination of the character of the coming man. The individual who succeeds in rising above his environment is at least somewhat exceptional.

The easily obtained history of habits of vagrancy which this patient gives, beating his way on railroads and steamships, wandering from one place to another, never working very long in any one

place, should be a sufficient cause for rejection. It is extremely unlikely that such a man will suddenly change his habits and be content to serve a four-year term of enlistment in the Navy, with its associated discipline, requiring unquestioning obedience to orders, without attempting to desert, or in some other way committing breaches of discipline.

Some little importance should be attached to the attack of heat prostration which this patient claims to have suffered while in the penitentiary. The obtainable history of this attack is, of course, vague, but it is a well-known fact that mental deterioration frequently does follow an attack of heat or sunstroke, and on that account a mental examination in such cases is most advisable.

The apparent utter failure of this man to consider the consequences of his action, either with reference to himself or others, stamps him as being an irresponsible, mental weakling, and therefore undesirable for the naval service.

His absolute lack of any discoverable ambition, beyond a mere existence, is to say the least, strong evidence of his undesirability.

This man's failure to adapt himself to the naval environment is merely what might be expected from his previous history. As will be seen from his subsequent history, as related by himself, he has, without exception, gotten into trouble in every place he has been since enlistment. He has no criminal or vicious tendencies, but he has been thus far utterly unable to adapt himself to any environment. On a farm, far from disturbing influences, where he could be permitted to always have his own way in doing things, under the guidance of a very tactful guardian, this patient might succeed in becoming, at least, self-supporting. But he is temperamentally, physically, morally, and mentally unfit for the naval service.

REPORT OF SIX CASES OF APPENDICITIS ABOARD THE U. S. S. "TENNESSEE."

By Surg. Moulton K. Johnson, United States Navy, and Asst. Surg. W. L. Mann, United States Navy.

The U. S. S. *Tennessee* left Charleston, S. C., November 10, 1910, bound for Colon, Panama, with the President and party, making a speed of 18 knots per hour under forced draft. After having been for the two previous months at a northern navy yard, the engineer's force was ill-prepared to undergo the severe physical strain or to withstand the high temperatures of the firerooms. The conditions were very similar to those occurring aboard this vessel during the 18-knot per hour cruise from San Francisco, Cal., to Honolulu, in September, 1909.

For three days and nights the men were constantly coming or being brought to the sick bay for treatment for heat exhaustion. It is estimated that at least 80 per cent of the men on duty came to sick bay for treatment. Over 100 men from the deck force volunteered for duty in the firerooms, and were accepted to assist the engineer's division. It is hard to realize the graphic picture of this condition that could be painted, but notwithstanding this hardship the "esprit de corps" was commendable; men actually begging not to be put on sick list. There seemed to be keen competition, as in every group of young men each endeavored to endure more physical hardship than his companions. At least 30 per cent of the engineer's force should, and would have been placed on sick list, if the circumstances had permitted.

The following is a brief report of six cases of appendicitis which occurred shortly subsequent to arrival of the ship at Colon. All were operated upon successfully in the Colon Hospital:

Case 1.—W. J. F., F. 1 cl., age 26. Admitted with prostratio thermica November 13, 1910. The usual symptoms were present such as anorexia, nausea, vertigo, transient muscular cramps, limited to the recti and flexors of arms and legs. After the disappearance of the acute symptoms the patient complained of right-sided tenderness of abdomen. Palpation revealed probable inflammation of ascending colon and typhlitis. Abdominal rigidity not pronounced; temperature normal; leucocytes 13,000.

Case 2.—H. J. Mc., C. P., age 20. Admitted with prostratio thermica November 13, 1910, with symptoms similar to case No. 1, but on pressure over McBurney's point pain was more noticeable. No temperature or rigidity. Muscular cramps not noted, only general tenderness of muscles existing. Weakness in this case was extreme. Anuria existed for 48 hours; urine when passed contained albumin and casts, and was of high specific gravity.

Case 3.—A. R., F. 1 cl., age 23. Admitted with prostratio thermica November 13, 1910. Symptoms similar to case No. 1. Temperature on one occasion 99.5° F.; normal at other times. Rigidity of right rectus pronounced; pain and tenderness over right iliac fossa.

The above three cases were discharged for change in diagnosis, admitted with appendicitis, and transferred to General Hospital, Colon, R. P., November 15, 1910.

Case 4.—J. H. R., Cox., age 23. Admitted November 15, 1910, at 8 p. m., with appendicitis. Usual symptoms of pain, tenderness, and right-sided rigidity existed. Temperature, 99.6° F. Patient had been on duty in the fireroom but had not suffered from heat exhaustion.

Case 5.—S. A. O., M. M. 2 cl., age 22. Patient came to sick bay November 16, 1910, complaining of pain and tenderness over McBurney's point. Palpation negative. Temperature normal. The patient's reiterated statements of symptoms were so exact, and pain and tenderness so accurately located, appearance at sick bay so opportune, and absence of other symptoms of positive nature that the case was classified as psuedo-appendicitis; probably caused by a desire to be transferred ashore; which, judging from our experience, is an etiological condition that should always be kept in mind. Patient put to bed and kept under observation. Temperature at noon 100.6. Transferred to Colon Hospital with other cases.

will ultimately place venereal infections in the same category with other well-recognized and controlled preventable diseases.

To California belongs the credit of being the first State officially to commence the fight.

For years the naval and military services of our country have reported the morbidity and mortality resulting from venereal infections and have instituted prophylactic measures, such as restriction of the liberty of one known to suffer from venereal disease, etc.

The civil communities from which these infections are invariably contracted have been inconceivably and almost inexplicably, if not culpably, slow in appreciating their duties and responsibilities in connection with the venereal diseases which have so long been granted immunity to control not enjoyed by most of the other infectious diseases. The general public's deplorably deficient knowledge of the sexual functions and of the ravages and communicability of venereal diseases, an almost insuperable unwillingness to admit to ourselves the truth of the naked facts which confront us in all of their bareness, and a sense of false modesty too long have conspired to prevent decisive action in the control of venereal disease. So late as June, 1910, was a section on genito-urinary diseases established in the American Medical Association, surprising as the statement may appear. Obviously coordination of the activities of this section and of the section on preventive medicine and public health can not fail to be of incalculable value, if there is due appreciation of the incumbent obligations and unfaltering discharge of distasteful duty.

This first official step of California indicates an intention to acquire more information regarding the frequency of and damage caused by these hitherto covertly mentioned diseases, and to disseminate this information among the laity preliminary to the further and more drastic action which will be inevitable when the people of California have been enlightened on the subject. California has resolutely "nailed her colors to the mast," and other States would do well to follow her lead in this pioneer effort.

THE USE OF SALVARSAN IN FILARIAL DISEASE.

The Bureau of Medicine and Surgery has sent a quantity of "606" to the senior medical officer at the naval station, Pago Pago, Samoa, where filarial disease is prevalent, and has instructed that officer to use the drug in the treatment of properly selected cases and to report upon the results obtained by him.

HOWARD TAYLOR RICKETTS.

The Bulletin has received from the department of public instruction and fine arts of Mexico a volume entitled "Howard Taylor Ricketts y Sus Trabajos Sobre El Tabardillo."

This graceful tribute to the genius and effort of one who fell a victim to Mexican typhus while aiding the Mexican authorities in identifying and combating that disease will be placed in the Naval Medical School Library for reference.

As a further tribute to the memory of this investigator the laboratory in the National Bacteriological Institute of Mexico, in which he conducted his researches, has been given his name and has been marked with a marble tablet bearing the inscription, "Laboratorio 'Howard Taylor Ricketts,' Mayo 3 de 1910," in order that "his name may be always visible in the Bacteriological Institute."

This signal recognition by the Republic of Mexico of the worth and sacrifice of Howard Taylor Ricketts should be an inspiration to those of our profession who are discharging all over the world the same duty to mankind that cost Ricketts his life and medical science one of its brilliant investigators.

TYPHOID VACCINATION.

The continued prevalence of typhoid fever in the Navy, as shown for the calendar year 1909 by its high morbidity rate of 3.4 per 1,000 the death rate of 29 per 100,000, which is higher than that of most infected ports visited, and the steadily rising damage ratio should serve to impress upon all medical officers the gravity of responsibility incurred when the disease appears in a command in which they have not exercised their utmost endeavors by argument, persuasion, and advice to impress upon all the importance of typhoid vaccination, both for the saving of lives and military efficiency.

The procedure by which the vaccine may be obtained without undue delay was given in the July, 1909, Bulletin, page 392, since which time there has appeared in the journals considerable literature corroborative as to the well-nigh absolute immunity conferred. Although the duration of immunity has not yet been determined, it is believed to parallel that of smallpox vaccine.

The United States Army now has over 17,000 of its personnel voluntarily immunized, who have subsequently furnished but six doubtful cases and no deaths.

Although the facilities for obtaining volunteers and the vaccine are equally good for the Navy, and there is greater urgency from our nonimmunes visiting each year highly infected ports, but 309 immunizations have thus far been reported to the Bureau of Medicine and Surgery.

FURTHER NOTES ON THE NEW BLANK FORMS.

The recently adopted health record appears to have been generally well taken up by the medical officers of the service, but there are some who do not understand the proper procedure in all circumstances. For instance, it has occurred several times that a health record is forwarded to the bureau having as its last entry a discharge from the sick list to duty, no further information being afforded as to what disposition has been made of the enlisted man. whether his service has been terminated by reason of expiration of the term for which he was enlisted, or by discharge for undesirability, or by sentence of a court-martial. Also the record in some instances is forwarded from a hospital with an entry in the medical history to the effect that the patient has been invalided from the service upon recommendation of a board of medical survey. In this connection it should be noted that the health record is to accompany the individual during his entire service; consequently the record should be closed by the medical officer of the command from which the discharge is actually consummated.

The entries relative to the condition of the man when discharged and also the abstract of health record should be completed before forwarding the record to the bureau, but there appears to be no necessity for starting a health record for the insertion of these entries in the case of enlisted men whose enlistment antedates the adoption of this health record and who have no entries relative to sickness, physical examinations, or vaccination subsequent to January 1, 1911.

The insertion of the name of the ship or station where an entry was made is important. The Bureau of Pensions frequently requests information regarding a man while he was serving on a certain ship, and unless the place of entry is specified it would be necessary by indirect means to ascertain the station of the patient at the time the entry was made in order to answer the inquiry. It has been necessary occasionally to return the health record in order that this entry may be properly made.

Frequent queries have been received as to what cases should be reported on the clinical card. In the instructions relating thereto it was not intended to convey the impression that clinical reports are desired in only the severe cases on the sick list, but rather that all cases sufficiently important to necessitate admission to the sick list as well as other cases not of a trivial nature should be reported. Attention is also invited to the intent of this card, which is not for pension purposes, but is purely a professional record, and while the origin of a disability, if traceable to a distinct cause, is of interest here the entry to the effect that it is "incident to the service" or traceable to duty or not to duty is irrelevant.

BACTERIOLOGY OF ACUTE POLIOMYELITIS.

Elsewhere in this issue of the Bulletin is published a laboratory report just received from the Pennsylvania State Board of Health.

The general interest in poliomyelitis and the authoritative source of the announcement actuate publication of the full text of the report.

The discovery of a microorganism in the blood of human cases of acute poliomyelitis and in the blood of monkeys infected with the disease causes the announcement to be of much interest, especially when it is considered that previous to the experimental infection of the monkeys their blood contained none of the organisms described.

However, Koch's postulates have not yet been complied with, and until further evidence of the specificity of the recently discovered organism is adduced judgment must be reserved as to its being the long-sought specific germ causing acute poliomyelitis.

HOSPITAL FACILITIES AT MONTEVIDEO.

The Navy Department has been informed by the State Department that, upon proper representation to the officer in charge of the British hospital at Montevideo, a statement has been obtained to the "effect that citizens of the United States and vessels flying the United States flag shall be accorded the same privileges by the hospital as are given to British subjects."

A CORRECTION.

In the United States Naval Medical Bulletin, volume 4, No. 2 (April, 1910), page 227, under the caption "The Noguchi Test for Syphilis," the sentence beginning near the end of the third line with the following words, "In reading the result," etc., to the end of the paragraph, should read as follows:

"A marked positive shows complete hæmolysis in tubes 1, 3, 5, and 6, and no hæmolysis in 2 and 4. A frank negative would show hæmolysis in all the tubes except No. 4."

A COURSE OF INSTRUCTIVE LECTURES.

The bureau has received an announcement of the following course of lectures to be delivered at the New York Skin and Cancer Hospital, Second Avenue, corner of Nineteenth Street, New York City, on Wednesday afternoons at 4.15 o'clock: Dr. Bulkley, March 1 and 8,

"Eczema"; March 15 and 22, "Acne"; March 29, "Psoriasis"; April 5 and 12, "Syphilis." Dr. Bainbridge, April 19 and 26, "Cancer."

The members of the medical profession will be admitted to these lectures upon presentation of their professional cards and without cost to themselves.

Cases, colored plates, models, etc., will be used to illustrate each subject, and it appears that no pains will be spared in the effort to make each lecture practical and instructive. This course requires no further guaranty of its professional excellence than the mere mention of the names of the lecturers.

It deserves a hearty and appreciative recognition at the hands of the profession, and it is hoped that the naval medical officers who can do so will avail themselves of this opportunity for the study of these topics which are of such vital interest to them in the performance of their professional duties.

PHYSICAL CULTURE.

Numerous inquiries about or requests for the literature descriptive of the system of physical culture recommended in the department's Order No. 94 have come to the Bureau of Medicine and Surgery. For this reason, it is deemed advisable to state that "My System," by Müller (the system referred to in Order No. 94), is neither issued by the Bureau of Medicine and Surgery nor by the Navy Department. but the book, if not readily found in the shops, may be procured of G. E. Stechert & Co., No. 129 West Twentieth Street, New York City. at a cost of $1.

A chart accompanies the book as a part of the system. For this chart an additional cost of about 25 cents is made.

PROGRESS IN MEDICAL SCIENCES.

GENERAL MEDICINE.

Surg. A. W. Dunbar and Passed Asst. Surg. J. L. Neilson, United States Navy.

Connor, R. C., M. D. **Hæmoglobinuric Fever on the Canal Zone.** Proceedings of Canal Zone Med. Assn., 1909.

The writer reports 80 cases, and remarks the unusual opportunities for the study of this disease on the Isthmus owing to the complete medical records of all cases of illness which are kept by the health department. The length of residence on the Isthmus of these cases varied from three and one-half months to three years, the greatest number of cases occurring after 15 months' residence in the Canal Zone.

Of these cases the numbers of previous admissions for malaria are as follows: In 19 cases, 2; in 17 cases, 1; in 11 cases, 3; in 7 cases, 4; in 4 cases, 5; in 3 cases, 6; in 1 case, 7; another, 8; another, 9; and another, 14; and 6 gave history of "many admissions." Four cases had a medical history.

The average number of days of illness immediately preceding the hæmoglobinuric fever was 7, with an invariable history of chills, fever, and headache. Forty-seven cases were admitted with hæmoglobinuria; 29 cases developed it after admission and after the administration of quinine. Of the latter, the majority appeared within 48 hours after taking quinine. In 23 of these 29 cases quinine was immediately discontinued, and the urine cleared in all within two and one-half days and the majority within 24 hours.

Of the 80 cases 10 died. In the 70 cases of recovery those having had quinine gave an average treatment of 24 days, as compared with 20 days for those in which no quinine was administered until after the hæmoglobinuria had ceased.

The weight of evidence favors a malarial origin, the malarial toxins exciting the formation of a hæmolysin or an autolysin. An idiosyncrasy is to be thought of in those cases which follow the administration of quinine and clear up upon its discontinuance. Connor has had 3 cases with a malarial history, but with the blood negative, in which quinine had to be discontinued three times, the patients eventually being discharged as recovered without further administration of the drug. He states there is evidence that condi-

tions which bring about immunity to malaria also lessen the susceptibility to blackwater fever and quotes Stephens as remarking that while in certain districts of Africa 90 to 100 per cent of the native children harbor malarial parasites there is no hæmoglobinuric fever.

Connor believes that this hæmolysis in blackwater fever is dependent upon malarial infection, but that quinine does not act as a curative agent. Without the administration of quinine malarial parasites disappear from the blood after a hæmoglobinuric chill, and it is believed that the hæmolysis serves to check the progress of the malarial infection, but not to an extent to justify the discontinuance of quinine *after* the hæmoglobinuria has ceased. The routine administration of quinine, gr. x, in solution, with tincture of the chloride of iron, mxxx, three times daily is suggested, commencing five or six days after the urine has cleared.

Upon admission calomel and magnesium sulphate are administered. One-half ounce of Basham's mixture is given every four hours; also normal saline solution, 500 cubic centimeters per rectum at similar intervals.

Pernicious vomiting and anuria are the most serious conditions to treat.

For the former internal treatment affords no relief, counter irritation to the epigastrium being more successful. Unless abundant secretion of urine continues morphine should not be used. If suppression occurred the case usually terminated fatally. Calomel in small repeated dosage, either alone or with cerium oxalate, appears to give the best results.

Where, owing to lack of facilities, the presence or absence of the plasmodium malariæ can not be established, it is best to withhold quinine. The hypodermic administration of quinine is contraindicated, as in these cases abscesses usually result.—(A. W. D.)

POLLOCK, C. E., Maj., R. A. M. C., **Malingering.** Jour. R. A. M. C., Vol. XVI, No. 1, Jan., 1911.

In the introduction to his paper before the United Services Medical Society, Pollock said:

> The malingerer, both in civil and military life, affords the medical man a most interesting and at times annoying study. The man who for any purpose feigns disease engages in a contest of wits with the doctor, and this fact should appeal to our sporting instincts.
>
> We should therefore welcome the malingerer, who, as it were, takes us on a staff ride in clinical observation.

If one man succeeds in evading unpleasant duty, other unscrupulous men are prompt to imitate him; should he, however, be detected and charges preferred or vile concoctions be used to hasten his re-

return to duty, other men enjoy and continue to remind him of his discomfiture. A conclusion of malingering must never be jumped at nor determined until every scientific method of investigation has been exhausted and *results recorded.* The man should receive the benefit of any reasonable doubt. The preferment of charges should not be made unless the medical officer is sure of his facts and prepared to clear up any doubtful point which may be raised before the court. "A failure to convict tends to discredit the medical officer with both the soldier and his officer." In services having voluntary enlistment only, malingerers are not met at recruiting stations, but there is found the opposite tendency, to conceal disability. Malingerers are abundant in recruiting stations of continental armies which have compulsory service, and in Russia the somewhat medically trained *feldsher* upon discharge, if unscrupulous, may find lucrative employment as the recruit's friend to determine the latter's weak points and, if possible, to accentuate them.

The chief motives are—

(1) To evade some unpleasant duty.

(2) In order to get admitted into hospital and have an easy time; this applies especially to men undergoing detention.

(3) Homesickness. Soldiers abroad are sometimes attacked by a longing to get home and will do anything to attain their object.

(4) To get out of the service.

(5) In order to obtain compensation for some injury by exaggerating its effects.

The conditions met are classified according to Beaupre (1822) into those "dependent on the man's own will" and those "induced by artificial means, with or without alterations in the tissues."

Of the former group the simulation of mental disease is the most troublesome, and in the absence of sufficient training in psychiatry on the part of the medical officer, who is also handicapped by the sympathies of the guard in the observation ward usually being on the side of the malingerer, the author suggests that the best solution of this difficult problem lies in the establishment of "a central establishment properly fitted up for the treatment of mental cases and placed under the charge of a specialist in mental diseases, assisted by a trained staff."

In the discussion Surg. Gen. Gubbins indorsed this opinion, with the proviso that in India the distances demanded four or five such stations.

Exaggerators who, by overworking their symptoms, sleep well are readily detected; but the "morbid, nervous individual, who has made up his mind to get home somehow, and is nursing a grievance against everything and everybody," is difficult to classify as "a pure malingerer or a patient on the border line of insanity." Astonish-

ingly rapid improvement takes place in 80 per cent of the insane when once the troopship leaves India for home.

"Ambrose Paré detected soldiers chewing soap," but soap froth is rarely seen nowadays.

One shrewd physician about the year 1817 remarked in the presence of a malingering epileptic that genuine epileptic fits occurred only in the morning. Hearing this, the man restricted his fits to the morning and was thus detected.

In one military hospital where sham fits were becoming uncomfortably numerous the plan was adopted of placing a bucket of cold water at the foot of the patient's bed and giving instructions that on the first sign of a fit anyone in the ward was to empty the bucket over the patient's head first, and only then to send for the medical officer. The majority of the men speedily recovered and deprived their fellow patients of an expected pleasure.

Sham epileptics never hurt themselves. The alcoholic-hysterical-pseudo-epileptic fit can hardly be designated as malingering, although if the victim really tries he can perfectly well prevent it; "vigorous mechanical stimulation" is justified in these cases.

The author seems to feel that such a formula as the following, with 10 grains of quinine sulphate sprinkled on top, will distinguish between true and false headaches, giddiness, dizziness, diarrhea, and vomiting:

℞

Ol. morrhuæ	ʒ j
Tr. ferri perchlor	♏ x
Tr. asafœtidae	ʒ ss
Ol. menth. pip	♏ v
Aq ad	ʒ ij

The tonic effect is so good that few men ask for a second dose. [It is also probable that few genuine sufferers would be likely to return.]

Complete deafness is an unpopular deception on account of the necessity for keeping in mind one's isolation from associates and the chance of being detected by the old coin-dropping ruse. The tests for both hearing and vision described by Balck [see Nav. Med. Bulletin, vol. 5, No. 1, p. 93] are commended.

The isolated medical officer unfortunate in not being a specialist in ophthalmology has to resort to tricks to detect defective vision simulated to account for poor target scores when beer or stupidity has been the true cause. The old test of applying a −2 lens to slightly improve (?) short sight neutralized by a +2 lens to improve vision still more is useful. A cube having single letters of different sizes on its six faces manipulated rapidly may prevent the malingerer from making up his mind just what type he should be able to read. To rule out unilateral defective vision the stethoscope may be held vertically 4 inches in front of the nose to prevent the malingerer from reading with ease unless he is using both eyes. Similarly, if through a card from which has been cut a hole one-half inch square.

and the card held a foot in front of the eyes, the man can by crossed vision read figures, say, by right and left eyes from 1 to 9, he must be using both eyes.

The Italians have another test, which consists of an oblong box in which are concealed two crossed tubes so that the right eye can only see what appears to be placed opposite the left eye and vice versa, although the person being examined does not know this. The opening apparently opposite the defective eye is closed, and you tell the man that you are going to test the sound eye. A test card is placed opposite the sound eye and he is asked to read it; if he does so, he is using the defective eye.

There is another old test dependent on the fact that a red glass neutralizes a green color and renders it invisible. On a test card you have FRIEND printed in large type, the F I N being in green type and the R E D in red type. A red glass is placed over the sound eye and a green one over the defective eye, and the man is asked to read the word. If he reads the whole word he must be using the defective eye, as the sound one can only see the R E D in red type.

Defective taste has not been simulated. Dumbness and hoarseness of high degree sometimes vanish before an unexpected pin prick, galvanic shock, or deluge of cold water. The medical officer may appear sympathetic and order many delicacies for the patient's diet, and, after taking care that only the plainest food is actually provided, have the sumptuous meals discussed in his presence, after a few days of which a healthy appetite calls for expressions too forcible for the malingerer to suppress. The mock consultation with suggested delicate and risky surgical operation, together with preparations with instruments and beginning anæsthesia, may be expected to inhibit self-control.

Voluntary starvation, together with self-dosing with magnesium sulphate to produce loss of weight, lassitude, and diarrhea, is likely to be discontinued by close observation in bed.

Well-known tricks to make the clinical thermometer register a fever are mentioned.

Blisters and other painful measures constitute good treatment for arthralgia as well as for spurious pains, but a pointed exostosis may be found by X ray to account for plantar pain on marching.

A self-inflicted minute laceration of the mucous membrane of the mouth, followed by sucking blood and churning with saliva and expectoration after protracted coughing in the presence of medical attendants may simulate hæmoptysis. The swallowing of such blood or of animal blood (furnished by a confederate) may be vomited to indicate hæmatemesis, and blood and other substances have been surreptitiously mixed with stools or urine for similar deception. The microscope, close watching, and physical examination facilitate detection.

The production of œdema or feeble pulse by constrictions are disclosed by thorough examination.

One or two capsules of picric acid swallowed will produce typical jaundice for one or two weeks, but the stools retain their color and reaction for the drug will be obtainable from the urine.

Drug rashes are seldom resorted to, the scarlatiniform eruption of copaiba being the only one practicable without undue assistance. Powdered cantharides (as well as lime from plaster) will cause a pseudo-diphtheritic membrane on tonsils.

Genuine subluxations are ruled out with difficulty unless the ability of the individual to produce them at times convenient to himself can be learned from outside sources.

Chewing tobacco and swallowing saliva in early morning is believed to be an occasional means of causing cardiac palpitation: digitalis and other drugs have been used for the same purpose in continental troops.

Local emphysema induced by syringes is often reported on the continent to suggest fractured rib after giving history of a fall. The scrotum and bladder have been similarly inflated to suggest rectal fistula.

The healing of wounds may be protracted by use of irritants or actual mechanical interference such as poking a needle through a bandage with distal and proximal ends sealed to prevent interference.

Mutilation by extraction of teeth, blowing off trigger finger, and the Russian *feldsher's* methods of producing temporary talipes equinus, uniting fingers, glove-stretching lax abdominal rings, and causing paraffin tumors are described.

French military prisoners have attempted to prolong their stay in hospitals by the injection of "petrol and vegetable juices into their thighs."

Caustic fluids, arsenical, and lime pastes have been used to produce ulceration and discharge from eyes, ears, and skin, while lighted cigarettes produced ulcers under prepuce.—SURG. C. N. FISKE.

THAYER, WILLIAM SYDNEY, M. D. On the **Presence of a Venous Hum in the Epigastrium in Cirrhosis of the Liver.** Am. Jour. Med. Sciences, March, 1911.

The writer reports a case of cirrhosis of the liver in a man, aged 47 years, in whom appeared a continuous venous thrill, and a long bruit de diable in the epigastrium. The thrill was felt in the xiphoid region and a little to the left above the lower margin of the liver. The murmur was heard in a limited area immediately about the xiphoid cartilage, but not about the umbilicus. This murmur was present at every examination during five years while the patient was under observation, disappearing the day prior to death, when well-marked ascites was present. There were no cutaneous varicosities.

The murmur was accentuated during inspiration. With breathing suspended after expiration, the murmur was diminished, and almost disappeared with the breath held following an inspiration. The murmur may have arisen in the inferior vena cava or from constriction of that vessel by a deformation of the cirrhotic liver.

Against either of these hypotheses are noted: (*a*) The limited area in which the murmur was audible. (*b*) The improbability that a murmur arising in the inferior cava should cause a distinct epigastric thrill. (*c*) The murmur was audible with greater intensity on the left side of the epigastrium, and the thrill was evident there only, a point not over the cava.

It is deemed more likely that the murmur was due to the presence of varicosities forming a connection between the dilated venules of the suspensory ligament and the radicles of the internal mammary veins, the immediate cause being the passage of blood under pressure from a smaller into a larger vessel.

Numerous references to previous reports of similar murmurs are made.—(A. W. D.)

MINOR, C. L., M. D. **The Use of the X ray in the Diagnosis of Pulmonary Tuberculosis. Bull. of the Johns Hopkins Hosp., September, 1910.**

The Roentgen ray has been used the world over and its application to medical diagnosis has already enriched our art and science. To no part of the body is it more applicable than to the thorax, owing to the ease with which it is penetrated by the ray, the vital organs it contains, and the frequency with which its diseases make demands upon our diagnostic skill.

To master the use of the ray demands constant, careful work and daily use of the machine, so that its use is limited. Its cumbersomeness and price are a barrier, except to those whose practice brings them, daily, cases to be examined. Not only this, but examination at infrequent intervals has led many men to lay this valuable aid aside as useless.

For general use the coil is better than the static machine, and the fluoroscope than the radiograph.

Even at best it is by no means equal to expert use of our standard physical diagnostic methods.

The author then gives a few essential points of technique: First, a tube with good sharp focus; second, an easy method of instantaneously raising or lowering the penetration of the tube without taking the eye from the screen; third, a proper diaphragm to cut down or enlarge the illuminated area; fourth, the fluorescent screen must be large enough to contain the shadow of the entire thorax at once; fifth, the tube must be in an opaque box lined with lead; sixth, the

patient must be 2 feet or more from the tube, with the transverse diameter of the chest at exactly right angles to the course of the rays (save during oblique radiation); seventh, the operator should spend at least five minutes in the totally dark room before starting the machine; eighth, complete familiarity with the normal picture is essential.

The author describes the importance of and the method of recognizing the apical shadow, and further deals with the shadow of the enlarged bronchial glands, giving the findings in incipient, moderately advanced, and advanced cases.—(J. L. N.)

PETERS, L. S., M. D. **Mercury Succinimid in the Treatment of Tuberculosis.** N. Y. Med. Record, December 31, 1910.

The author briefly states that, after an experience of 18 months with this form of treatment, it is his opinion that mercury has no beneficial effect upon tuberculosis, and that this is also the opinion of most men who have had much longer and broader experience than he has had. He believes that those cases which show marked improvement under the treatment are either evidently syphilitic or have the syphilitic taint, or would have shown equal amount of improvement solely from the hygienic and climatic conditions which existed during the treatment. He recalls to our mind the fact that this drug (mercury) was used in the treatment of tuberculosis years ago, was found wanting, and was discarded. Now we have again "let the pendulum swing too far on the high road to recovery, and now after about two and one-half years it has returned with a resounding whack and shattered all the fondest dreams of those who looked for wonderful results from the hypodermic injection of mercury."—(J. L. N.)

RUDOLPH, R. D., M. D., F. R. C. P. **High Blood Pressure in Arteriosclerosis.** Br. Med. Jour., November 26, 1910.

At first high blood pressure was described as a constant symptom in arterial sclerosis. Later it was found that in many cases of marked sclerosis the pressure was not raised and in some individuals was even below normal. The next view entertained was that the high blood pressure resulted only when the splanchnic system of arteries was involved. It has, however, been shown that high blood pressure may occur from many causes other than arterial thickening, and because an individual happens to be arteriosclerotic he is not exempt from such other causes.

If a high blood pressure is detected in one in whom arterial thickening is present, it is safe to say that it results from one or more of the following causes: (1) Toxæmia, such being at the same time

the direct cause of the arterial disease by directly poisoning the vessel walls. Example, nicotine. (2) Some toxin which has nothing to do with the associated arteriosclerosis, but is directly raising the pressure. Example, overactivity of the adrenal tissues. (3) Compensatory, the result of some pathological condition which renders some important brain center anæmic. Example, new growth pressing upon vessels supplying medulla. (4) Simple nervousness: It is common to find the pressure high from nervousness, as in neurasthenia. (5) Lastly, the raised pressure may be due to the arterial disease alone, and in this case the splanchnic vessels or the aorta leading to them are extensively diseased.

The author feels that the rôle of arteriosclerosis as a cause of hyperpiesis is limited, while the rôle of hyperpiesis as a cause of arterial disease is an important one. Given a constantly or occasionally increased blood pressure for any length of time and the arteries will tend to be dilated, and to prevent this dilatation the arterial walls will tend to thicken, acting in the same way as does the wall of the left ventricle. This has been proved experimentally and is evidenced by clinical observations.

He next quotes the classification of arteriosclerosis as given by Sir T. Clifford Allbutt: (1) Those due to hyperpiesis; (2) those of toxic or infective nature; (3) involutionary cases. In the first class the raised blood pressure precedes and produces sclerosis. In the second the pressure may not be raised or may be so at a late stage and is the result of the disease. In the third (senile type) it is usually absent, or if present is an intercurrent event and very often due to dietetic and medicinal influence. The author reminds us that we must not forget the terminal cases of arteriosclerosis where, with big heart and thickened vessels, we find a low pressure.

With regard to the measurement of the pressure, he calls attention to the fact that in certain conditions a spastic condition of the muscular coats of the arteries exists (peritonitis, etc.), in which considerable pressure is necessary to overcome the resistance of the vessel walls themselves before any force is exerted upon the blood stream. This is equally true in the hardened walls of arteriosclerotic patients, and allowance must always be made for it. Wormach found experimentally that the resistance of such an artery might amount to as much as 34 millimeters of mercury. In no case are we justified in accepting a high reading when the heart shows no signs of enlargement or the aortic second sound is not accentuated.

It would probably be safe to argue that in a case of arteriosclerosis with increased pressure the relative difference between the systolic and the diastolic pressure would be a measure of the degree to which the increased pressure was due to the sclerosis of the arterial tract between the heart and the point at which the pulse is being felt.

Treatment: To better illustrate the treatment of arteriosclerosis the author divides the course of the disease into three stages.

First stage, (1) toxæmia. Second stage, (1) toxæmia; (2) organic change in walls of vessel and left heart and probably kidney. Third stage, (1) toxæmia; (2) organic change in walls of vessels, left heart, and probably kidney; (3) breaking down of diseased circulatory apparatus. That is to say, the toxæmia, or presclerotic stage, continues long after the further stages of actual sclerosis and even heart involvement have become evident. Therefore not only must our treatment be brought to bear in the presclerotic stage, but we must continue to fight the toxæmia in order to prevent the sclerotic condition from becoming worse. The presclerotic stage, or the stage of hyperpiesis resulting from the toxæmia, should be discovered early by examining every individual over 40 years of age as to his blood pressure once every five years. When such a condition is found our effort is to reduce to a minimum the absorption from the intestinal tract of certain bodies known as the aromatic series, which are, in a vast majority of cases, the cause of the toxæmia. These bodies come from either excessive proteid ingested (meat and eggs) or faulty handling of it by the alimentary tract.

Given, then, an individual with any one of the progressive stages of arteriosclerosis, we should cut down his animal proteids, putting him chiefly on a lacto-vegetarian diet, prohibit excessive smoking and the use of alcohol, and give him a mild saline every morning, with an occasional mercurial purge. If this proves ineffective, add regular small doses of potassium iodide. If the pressure remains high, use severe purgatives, and even bleeding may be necessary, although the latter must be undertaken with great caution, as the pressure may be compensatory. As regards vaso-dilators, the author quotes Dr. Edwin Matthew: (1) The effect of nitroglycerin in one one-hundredth grain doses lasts about one hour, but a tolerance is soon established; (2) the effects of sodium nitrite in 2-grain doses last about two hours and no tolerance occurs; (3) erythrol tetranitrate in one-half grain doses lasts about six hours and no tolerance occurs; (4) mannitol nitrite in 1-grain doses acts as erythrol, but the effect is even more prolonged, and hence is to be preferred.—(J. L. N.)

WHITE, W. H., M. D. **The Treatment and Prognosis of Exophthalmic Goiter.** Lancet, December 3, 1910.

The author's opinions are based upon observation of cases extending over a period of 20 years. He first calls attention to the fact that many cases recover spontaneously; that there is a higher death rate from all diseases among those suffering from exophthalmic goiter

than is shown by general actuarial tables for all persons, the proportion being 15 to 8; that very few die of the disease itself, and that those fatal cases indicate an intimate relationship between this disease and gastro-enteritis, unstable nervous system, acute rheumatism, and diabetes mellitus; that a smaller percentage die in private cases than in hospital cases.

Regarding those cases that had not died during the 20 years, the author states that of 87 (26 hospital and 35 private cases) 61 had "done well" (improved sufficiently to be unhampered in any way by the disease) and 5 were "not well." Of these five, two showed slight improvement and three had refused treatment.

He then classes these cases into (*a*) mild or average, (*b*) severe, (*c*) very severe, which table shows that of those who had "done well" 36 were in class (*a*), 16 in class (*b*), and 9 in class (*c*). Of the latter nine, eight were in private practice and one in hospital practice, which shows that more severe cases get well among private patients than among those treated in hospitals.

The author regrets that there are no reliable statistics extending over a considerable period regarding the ultimate results of surgical treatment. He contrasts the danger of operative treatment (as shown by the high mortality resulting either during or immediately after operation) with the safety of medical treatment, and he feels that the former method will not yield a higher percentage of ultimate cures than the latter one.

He expresses extreme hesitancy in trying to estimate the relative value of drugs in these cases and mentions the fact that he has been using Moebius's antithyroid serum and rodagen (the dried milk of goats whose thyroids have been removed). He places great stress upon absolute rest in bed, careful feeding, freedom from worry, and the use of hyoscine to keep down nervousness.—(J. L. N.)

SCHNEYER, J., M. D. **Some Clinical Methods of Diagnosis of the Functional Activity of the Heart.** N. Y. Med. Jour., January 21, 1911.

The writer believes that the usual anatomical diagnosis of diseases of the heart gives an incomplete conception of the true condition of the diseased organ. He urges that we pay more attention to its functional capacity and gives certain methods for estimating this capacity.

1. Change of pulse rate on change of posture: In health on changing from an upright to a recumbent position the pulse becomes slower by a few beats. Absence of this normal reaction, shown either by the pulse remaining the same or by an increase in rate upon lying down, shows functional incompetency or insufficiency of the heart. It may

occur in various cardiac disorders as well as in other acute or chronic diseases. Anatomical lesions of the heart with good compensation show the normal slowing.

2. Pressure on the femoral vessels: (*a*) In people with normal functional capacity of the heart muscle compression of the femoral arteries produces a rise in general blood pressure by from 15 to 20 millimeters of mercury. It may not affect the heart rythm or may cause it to become slower. (*b*) In moderate degrees of insufficiency such pressure may have no effect on blood pressure, but may increase the frequency of the pulse or have no effect. (*c*) In severe cases of cardiac insufficiency there is a distinct fall in blood pressure and an increase in pulse rate. (*d*) In cardiac insufficiency with good compensation there is a rise in blood pressure of from 15 to 40 millimeters and no change in pulse rate. (*e*) When there is poor compensation, the blood pressure rises slightly and the pulse rate becomes more frequent.

3. Muscular exercise: The patient is required to rise from bed or to walk rapidly to and fro or to climb stairs, and is then examined as to character of pulse and heart sounds, as to pallor, cyanosis, dyspnœa, vertigo, and other phenomena of cardiac insufficiency. He recommends the ergometer devised by Graupner as the instrument of precision in estimating the amount of work done by muscular action. The blood pressure and the time necessary for recuperation are observed in connection with the amount of work done and the degree of insufficiency is thus estimated.

The advantage of the first method is that it can be used in the sick room in any circumstances. The second method has the great advantage that it can be employed in even the most severe cases without disturbing the patient.

Regarding the third method, he feels that the results are not always typical, but that it has its special use in convalescence from infectious diseases, if we wish to determine when the patient may be allowed to resume his usual occupation.—(J. L. N.)

BERKELEY, W. N., A. B., B. Ph., M. D. **Further Notes on the Treatment of Paralysis Agitans with Parathyroid Gland.** N. Y. Med. Record, December 24, 1910.

The author first briefly reviews the literature of the subject, referring first to the experiments on dogs in which the parathyroids were removed, thereby giving rise to hurried respiration, tachycardia, profuse salivation, twitching and shivering of involuntary muscles, rigidity, intermittent convulsions, rapid wasting, and death. Upon further investigation MacCallum, W. G. (Johns Hopkins Hospital

reports 1908), found that a suitable dose of soluble calcium salt injected into the veins of the dog restored the animal to normal for a few hours. From like experiments the author thinks that the parathyroids furnish enzymes of prime importance in the intermediary metabolism of nitrogen and that the calcium has only a "drug effect." These experiments strongly suggest some causal relation between a defective secretion of these glands and one or more of the known convulsive diseases, and the most recent knowledge indicates that tetany is unquestionably one of the latter. The author believes that paralysis agitans is another, offering in support of his hypothesis the following:

Paralysis agitans has all the marks of a chronic toxæmia; the symptoms following parathyroidectomy are remarkably like those of paralysis agitans; in cases of myxœdema and exophthalmic goiter paralysis agitans has not infrequently occurred as a complication or sequela; of 14 reported autopsies on paralysis agitans 11 showed negative parathyroids and 3 pathological changes; and, lastly, a remarkable percentage of cases of paralysis agitans treated with properly identified fresh gland or a properly made extract have been greatly benefited.

He finds the commercial preparations of the parathyroid very unsatisfactory, owing to their uncertainty of action.

He has worked out and describes a method of preparation which gives a satisfactory product that can be transported to any distance and is easily handled. Each capsule contains one-fiftieth of a grain of parathyroid nucleoproteid, the average dose being two capsules a day, and bottles of the capsules are on sale at several New York pharmacies. There are no special contraindications to its use in paralysis agitans, and the best results are obtained from small doses continued three months to a year. A "cure" is always to be spoken of with reserve.—(J. L. N.)

WAKELING, T. G., M. R. C. S., L. R. C. P. **On Fever Caused by the Bite of the Sand Fly** (*Phlebotomus papatasii*). British Med. Jour., October 15, 1910.

A newly discovered fever is caused by the bite of a sand fly, the *Phlebotomus papatasii*, known to occur in Egypt, Austria, Malta, Italy, and probably found more widely distributed. For many years this fever has been described as influenza, dengue, malaria, and Egyptian fever, yet it differs markedly from each of these diseases. Newcomers seem more prone to the disease and it is more prevalent during hot, dry seasons. The incubation period is about four days and the disease runs its course in three to nine days, with a week's convalescence. It may be followed months afterwards by neuritis or effusion into the pleural or synovial cavities. The symptoms are local and general. The local symptoms consist of intense itching, followed by the formation of a raised lump surmounted by a vesicle

with a surrounding zone of inflammation. Malaise, anorexia, aching in head and limbs, and chilliness are the first general symptoms. The temperature rises sharply to 101° or 104°. The digestion is disordered and later there is anemia and rapid loss of weight. Blood is negative as to organisms. A full description of the fly and its habitat are given by this observer, and a few brief suggestions as to preventive treatment complete the article.—(J. L. N.)

De Vogel, W. T. **Myzomyia Rossii as a Malaria Carrier.** Philippine Jour. of Science, Vol. V, No. 3, August, 1910.

As chief medical officer at Samarang, Java, the author made certain observations and experiments relative to the occurrence of malaria in the Dutch East Indies, which would indicate that the accepted opinion in regard to the anopheline, *Myzomyia Rossii*, was open to question. From his studies he concludes that this species will breed both in fresh and salt water. In the former it will not become infected with malaria, while in the latter it will. The higher the percentage of sodium chloride present the more easily is it infected.—(J. L. N.)

Patterson, R. H., Maj., Medical Corps, United States Army. **A Modified Caldwell Kitchen Incinerator for Field Use.** The Military Surgeon, November, 1910.

After making practical use of this incinerator and comparing it with other forms Maj. Patterson reaches the conclusion that it is the best form to use in active service and even in maneuver camps. It is cheap, easily constructed, and requires the care of only one man. Its capacity is limited to one company. The method of building and using the incinerator is as follows:

Dig two trenches 10 feet long and 10 to 12 inches wide, bisecting each other; each trench to be 18 inches deep at the point of bisection and gradually shallowing toward their ends. Over the place of bisection put four boards or sticks to support a barrel or box with ends knocked out. Around this and up to and above the top pack sods. Then burn out the supports and barrel and a hard self-supporting cone of earth is left.

The fire is kept going by feeding fuel through the top of the cone and material for incineration is fed to it in the same way. Draft is obtained by leaving one of the four trenches open toward the wind. Each day the ashes and débris are removed and a fresh fire started. Liquids are disposed of by pouring slowly into the open trench.—(J. L. N.)

SURGERY.

Surgs. RAYMOND SPEAR and EDGAR THOMPSON, United States Navy.

STANTON, E. McD., and KRIDA, A. **The Cause of Death from Shock by Commercial Electric Currents and the Treatment of the Same.** New England Medical Monthly, Vol. XXIX, No. 9.

The chief causes of death are fibrillary contraction of the heart and respiratory paralysis. The ventricular fibrillations take place during the passage of the current and the heart is unable to reestablish the normal rhythm. The maintenance of normal heartbeats largely depends on a full blood pressure in the coronary arteries and when this pressure falls to zero (in about 15 seconds) resuscitation is hopeless unless an artificial increase in blood pressure can be induced.

Respiratory failure seems to be due to an anæsthetic condition of the central nervous system and the proper treatment is artificial respiration until the nervous paralysis passes away. The authors state that—

> Artificial respiration may be maintained either by manipulation of the body itself in such a manner that the chest cavity is alternately compressed and expanded, or by the use of a pump or a bellows so manipulated as to force air at regular intervals through the trachea into the lungs in sufficient volume to expand the chest and properly fill the lungs, expiration being accomplished by simply releasing the pressure and allowing the chest walls to collapse.
>
> Sollmann was the first to show that ventricular contractions depend upon a sufficient pressure in the coronary arteries, and that the quiescent heart may be made to beat if some fluid, even metallic mercury, be forced into the coronary arteries. Crile and Dolly finally devised a means of producing this necessary pressure in the coronary arteries with the heart in situ, as follows: First, the arterial system is rapidly filled with salt solution by injecting the solution toward the heart through a suitable peripheral artery, and at the moment when the arteries are nearly filled, adding a sufficient amount of adrenalin chloride which causes the vessel walls to contract, and thus rapidly raises the blood pressure within the arteries. At the proper moment the heart is stimulated by a few quick compressions on the chest wall, which cause it to immediately jump into action, beating very vigorously from the first beat.—(E. T.)

KELLY, HOWARD A. **The Best Method of Exposing the Interior of the Bladder in Suprapubic Operations.** Surg. Gyn. and Obstet., January, 1911.

The bladder being deeply placed has always been more or less difficult of approach when surgical procedures have been indicated. The chief difficulty comes from the resistances experienced in drawing aside the recti with their overlying fasciæ. The operator works in the lower angle of a rigid V. Sometimes it has been necessary to partially divide the recti to gain more room. This renders patients liable to the development of hernias.

Kelly's method of exposure of the bladder is performed by making a transverse incision about 1 inch above the symphysis pubis through the skin and fat down to the fascia. The incision is semilunar in form, with its concavity directed toward the navel, and is about 6 inches long. The strong fasciæ covering the recti and the oblique muscles are next dissected free by blunt dissection from the underlying muscular tissues. The flaccid recti being no longer splinted by the fasciæ are readily drawn aside by retractors, and the bladder, which is inflated by air, presents in the wound. The bladder is then fixed by two silk guy sutures and can be opened layer by layer transversely so as to avoid the vessels and peritoneum. There will be no escape of urine into the wound if the bladder is emptied and then walled off.

After concluding the vesical operation and sewing up the bladder the recti are approximated by interrupted catgut sutures, the divided fasciæ are united by sutures, and the bladder is drained suprapubically.—(R. S.)

BALLENGER, E. G., M. D. "606." New York Med. Jour., December 10, 1910.

In about 13,000 cases of syphilis treated by "606" there have been 12 deaths in adults, only 2, however, were directly traceable to the remedy, the others were in a moribund condition from organic disease and should not have received the injection. The mortality in syphilitic infants was high before the proper dosage and treatment were worked out.

The author states that the most startling and satisfactory results were seen in malignant cases and in cases with active lesions. Apparently the most resistant lesions of syphilis, except the chronic interstitial keratitis, is the small recurrent syphilide. Wechselmann thinks the organisms are protected at times by an obliterative endarteritis or some such process. The first dose of "606" kills the majority of the spirochætæ, absorbs the protecting wall around the others, and makes them easy prey for the second dose.

A Wassermann reaction should be made as a preliminary step to the injection of "606" and should be studied at intervals to determine the progress of the case. The reaction usually becomes negative in from two to six weeks, but varies. The reaction may be misleading. as at times a large number of killed spirochætæ may cause it to become positive while the patient harbors no living germs, or only a few germs may permit it to become negative only to become positive at a later date.

Beginning cases of locomotor ataxia and beginning syphilitic insanity have been checked and cured, so we need not be so cautious as

Ehrlich would wish us in treating advanced lesions of the nervous system.

Of interest in animal experimentation is the fact that apes treated early after the appearance of an artificially produced chancre can be reinoculated with syphilis at a later date. Successful reinoculation in cases of advanced syphilis after treatment with "606" is more difficult to obtain.

Nursing syphilitic infants are cured if the mother is treated with "606." Ehrlich advises that these infants be given a separate dose of "606" later.—(R. S.)

MAYO, C. H. **A Consideration of Surgical Methods of Treating Hyperthyroidism.** Med. Record, December 31, 1910.

Studies from a pathological standpoint have been made in over 2,000 thyroid cases that have been operated upon in the Mayo Clinic. The gland is of invertebrate origin and was originally a sex organ; in fact, the association is still retained in the goiters of adolescence, in the goiters of pregnancy, and the congestion of the thyroid at the menstrual periods.

The author quotes MacCarty, and states that the process of goiter may be a reversion of the thyroid gland to some former function.

Hyperthyroidism is a toxæmia, the result of absorption of the products of the hyperactive thyroid.

Goiters are classified pathologically as follows: (*a*) Cystic goiter, (*b*) hypertrophic parenchymatous goiter, (*c*) hypertrophic fœtal thyroid, (*d*) papillary cystic goiter, (*e*) fœtal adenoma of the thyroid.

The surgical treatment of simple goiter is simple, but the operative treatment of hyperthyroidism is a more complicated problem.

Most patients that seek relief from goiter have either simple goiters or hyperthyroidism. The simple goiters cause local symptoms by pressure, but those patients that suffer from hyperthyroidism are systemically affected. The local symptoms or size of the growth are of secondary importance.

In hyperthyroidism reversion to a state of simple goiter may occur at any stage of the disease, apparently without cause. Other cases are apparently favorably influenced by treatment unless the fatal termination occurs in the first few weeks. Cases of hyperthyroidism usually present remissions before the fatal ending.

A reduction of the secretion of the gland is now aimed at in the treatment of hyperthyroidism. From a surgical standpoint the ligation of vessels with nerves and lymphatics causes a reversion of the hyperthyroid condition to one of simple goiter.

The present low mortality from an operative standpoint is due to the selection of the time to operate and the type of the operation performed.

In cases of hyperthyroidism there are many fluctuations from mild to moribund conditions. In severe cases the preparation of the patient should be an important consideration before any kind of operative interference is attempted. Early cases that were formerly treated by medical measures are usually safely treated by ligation at the upper poles.

Serious conditions, such as a dilated heart, fatty degeneration of the liver, nephritis, œdema, and cerebral incoordination, are many times benefited by ligation of the vessels at the upper poles at one operation, or by ligating the vessels of the second pole some time after ligating those of the first.

The average gain in weight after ligation operations has been about 20 pounds in four months. At this time or later a partial thyroidectomy can be performed with almost no mortality, especially if patients who have relapsed are again tided over the exacerbation period by the ligation of one inferior artery and an interval of a few months has elapsed.

When operative procedures fail to relieve the condition, when little of the gland was removed, or when the remaining portion of the gland has hypertrophied and thereby increased the output of secretion, further ligations of vessels should be performed, or it may be necessary to remove the remaining lobe at a later period.

The anæsthetic used by Mayos in their thyroid cases is ether, preceded by a hypodermic injection of morphine (one-sixth grain) and atropine (one one-hundredth grain). Occasionally, where the general condition is serious or where there are heart complications, local anæsthesia has been employed.

The mortality in a series of 1,100 operations for hyperthyroidism was 3.7 per cent following ligation and 3.9 per cent following extirpations. This includes the high mortality of the early work at the Mayo Clinic, when surgical deaths included many that should have been medical.—(R. S.)

BELFIELD, WILLIAM T. **Genito-urinary Diseases. Progressive Medicine, December, 1910.**

The author summarizes his own views as to the treatment of "pus tubes in the male" by "vasostomy" and irrigation, which he has practiced for five years past. He refers to bacteriological demonstrations of gonococci, staphylococci, and bacilli of the colon group in the contents of the seminal vesicles and to the demonstration of *B. typhosus* in them in two patients dead of typhoid, and to the demonstration that seminal vesicles of apparently healthy domestic animals often harbor bacteria. He believes that nongonorrheal urethritis and cystitis may originate in extension of such unsuspected

infections, and says "herein is found an additional reason for irrigation of the vas and vesicle through a vasostomy." We are not surprised that the author has not had more imitators during the past five years, and we think it will be a long time before this practice is followed by surgeons generally.

Reference is made to Judd's report of 15 cases of vesical tumor removed by the transperitoneal route, with 14 recoveries. In the report of this series it is said: "Although we do not advise or believe it necessary to go through the peritoneum in removing tumors in the upper quadrants of the bladder, our experience would lead us to believe that [most of the] neoplasms of this viscus begin in or near the base, and that we can, with very little if any greater risk to the patient, do a much more technical and radical operation through the peritoneal incision."

Beer and Keys have made use of high frequency currents passed through the substance of the vesical neoplasm. A single pole is introduced by insulated cable through the catheterizing cystoscope. The effect on the growth is similar to cauterization. Repeated contacts or "burnings" are made at each sitting, each contact lasting until the patient complains of pain, usually but a few seconds. Improvement and even symptomatic cure have been accomplished.

The possibility of confusing right ureteral calculus with appendicitis is brought to attention. A calculus at the brim of the pelvis may cause pain at McBurney's point, temperature, and leukocytosis. "Many a normal appendix has been unnecessarily removed, and many other lesions in this region simulating appendicitis have been overlooked, because of the prominence given to appendicitis in current medical literature." Brown, Englebach, and Carman in the Journal of the American Medical Association for May 7, 1910, show in an illustrated article a method of diagnostic localization for ureteral stone by skiagraphs of a sound passed into the rectum.

Bovée states, from observations in eight cases of ether and eight of chloroform anæsthesia, that during anæsthesia in the Trendelenburg position almost no urine was received in the bladder. Hence it would seem that the Trendelenburg position introduces an element of danger in anæsthesia of patients presenting renal insufficiency, or cardiac or arterial lesions.

Colon bacillus infections of the urinary tract have been treated by Finney and Mayo with the appropriate vaccine with the most marked success. That this is a common genito-urinary infection is shown by Rovsing's report of 285 cases diagnosed and treated by him in 12 years.

The article concludes with an extended review of the relations of various ductless glands to diseases of the urinary and genital organs. The adrenal cortex and the hypophysis cerebri seem to be intimately

associated with the development and functional activity of the genitals in both sexes. Every pronounced abnormality of any ductless gland seems to be associated, either as cause or effect, with distinct abnormality of the sexual glands (testes or ovaries), and with changes in the secondary sexual features, such as body and face hair. With increasing knowledge we may expect to find in the sexual organs and characteristics diagnostic aids in recognizing lesions of the various ductless glands.—SURG. J. F. LEYS.

WICKHAM, LOUIS. **Radium therapy.** Boston Med. and Surg. Jour., December 29, 1910.

Radium emits three kinds of rays, the so-called alpha, beta, and gamma. The alpha and part of the beta (the soft) rays have but slight penetrative power. Certain of the beta and all of the gamma are capable of exerting influence deep within the tissues, and to these harder, more penetrating rays radium chiefly owes its therapeutic value.

The sulphate of radium is incorporated in a hard varnish which is spread upon roughened copper plates of various sizes and shapes, or upon cloth. Pieces of cloth so spread may be directly applied to the surface like the copper plates, or may be put in glass capsules which are inclosed in tubes of sheet metal screen (lead, aluminum, etc.), so shaped as to be introduced into natural body openings, fistulæ, wounds, etc. The soft rays are cut off where superficial action is not desired by screens of thin metal sheet or foil, lead and aluminum being the best substances for such screens, but rubber, tin, mica, and other materials are sometimes used. Aluminum has the advantage of being clean and light in weight, the screens made of it being one one-hundredth to eight one-hundredths millimeter in thickness. The best results in radium therapy are obtained by allowing rays to penetrate simultaneously from several directions (cross-fire). This reduces the time of exposure and enhances the effect.

Radium has proved itself most valuable in carcinoma. On the carcinomatous epithelial cells its action is destructive, the changes produced in cell body and nucleus being marked and characteristic. In the connective-tissue stroma of the tumor it has a vital stimulating effect, producing young cellular elements which penetrate and break up the tumor mass, replacing it with cicatricial tissue. These effects are produced at a depth of from 1 to 6 centimeters. At a greater depth, 6 to 9 centimeters and even beyond, there is evidence of tissue change. Radium rays, like X rays, thus show selective effects on certain tissues. Unlike X rays, however, their effects are strictly local at the point of application. Involved neighboring tissues and

metastases are unaffected. Radium therapy can not undertake to supersede surgery in the treatment of carcinoma, but is of great value as a subordinate adjunct.

Leucoplakia, cheloids, hypertrophied scars, and angiomata are amenable to cure by this agency. Chronic eczema, psoriasis, linear ichthyosis, lichen planus, tuberculosis of the skin or deeper parts, acne rosacea, pruritus, and certain types of papilloma are treated with frequent but not invariable success. For all these superficial conditions the soft rays are used in large numbers and for only short exposures. For pigmentary and hairy nævi, radium treatment is not advisable, as it sometimes produces inflammatory reactions in these conditions.

Radium is stated to have the power of relieving congestion and the pain dependent upon it in such diseases as gastritis, rheumatic arthritis, and deep-seated, painful neoplasms.—SURG. J. F. LEYS.

HARRISON, PAUL W., M. D. **The Intravenous use of Cocaine, Report of a Case.** Boston Med. and Surg. Jour., February 4, 1911.

The following interesting article, clipped from the Boston Medical and Surgical Journal, is published verbatim because the writer's description of an experiment performed upon himself will convey to the reader a more comprehensive idea of the sensations experienced than could be given in a review or modification of his own words:

In the Berliner Klinische Wochenschrift, Vol. XLVI. page 1701, Ritter reports experiments on animals where cocaine in moderate doses (one-half grain) was administered intravenously. This was followed almost immediately by complete general analgesia. There was little or no interference with motor function. The results were so striking as to apparently demand investigation in human beings.

The subject of this experiment during the past three years three times had local anesthesia produced with cocaine—once of a finger, once for work on teeth, once about a boil on the back of the neck. The analgesia produced at these times was not different in character or duration from that usually seen. There had been no other use of cocaine or allied drugs. This experiment was performed as follows:

Into one of the superficial veins of the back of the hand there was slowly introduced 5 grains of cocaine in a 2 per cent solution. The introduction of the solution was completed in about 30 minutes. Dizziness and palpitation made it seem wise to stop with this amount. Tests of the patient's condition were made at once and results found to correspond in an incomplete way with those reported for animals.

Cerebration was normal except for a restless inability to keep the mind long on one subject. Motor power was quite unimpaired.

There was marked analgesia everywhere. An incision three-fourths inch long through the skin, well down into the fat, was made on the anterior surface of the lower leg. This incision could be felt. It caused a mere trifle of pain. Two or three small nerves in the fat were cut. Each caused a slight twinge of pain. Apparently operative procedure might readily have been undertaken with only very moderate discomfort.

Two hours later a similar central incision was made on the opposite side. The sensation of pain had by this time recovered much but not all of its normal intensity.

It would seem evident, then, that, however suited to animals this method may be, the relatively enormous dose necessary for even an imperfect result makes it quite impossible for human surgery.

[This contribution is of peculiar value, since the experiment was performed by the writer on himself, a fact of which he modestly makes no mention in the text. It is evident that the information gained from this first-hand method of experimentation has a far greater validity than that through animal experimentation, although manifestly not widely applicable.—ED.]—SURG. J. C. PRYOR.

MAYO, W. J. **Diseases of the Stomach and Duodenum, from a Surgical Standpoint.** N. Y. State Jour. of Med., January, 1911.

According to Mayo, in the past too much attention has been paid to the chemistry of the stomach, and the more important functions of storage and motility have been relatively neglected. This has led to fundamental misconceptions and errors in diagnosis and treatment. The mechanical action of the stomach on food is much more important than the chemical. The author believes this is shown by the histories of over 300 gastrectomies in which the entire pyloric end of the stomach was removed. This would reduce to a minimum the secretion of hydrochloric acid and pepsin. Yet in all these cases there was no gastric distress provided, there was no obstruction to the progress of the food mass into the intestines.

Further, in gastrojejunostomy the physical result is to constantly flood the stomach, especially the pyloric end, with the alkaline biliary and pancreatic secretions. This must neutralize the acid gastric secretion and interfere with all the stomach functions except motility, but the relief afforded by the operation would indicate that the chemical disturbance was unimportant.

The stomach has two well-defined compartments: First, the fundus, which is for storage, and is, to some extent, under the control of the cerebro-spinal nervous system, and the individual is more or less conscious of the condition of this portion. Second, the pyloric antrum, where the secretions and muscular action are most active. The control of this portion, as well as the remainder of the intestinal tract, is maintained by internal secretions through chemical stimulation in the blood stream and through the sympathetic ganglia. Of this part of the stomach we have little conscious control or knowledge.

The author says:

The fundus of the stomach was a late development, and is consequently more or less under the control of the cerebro-spinal nervous system; it follows, therefore, that the stomach is the place where derangements of the entire intestinal tract between the beginning of the antrum and the splenic flexure may reach the consciousness of the individual. This is the reason why strangulated

hernia, appendicitis, gallstones, intestinal tumors, intussusception, etc., cause nausea and vomiting and pain in the stomach; the distress arising from nature's endeavor to secure rest by means of the so-called "pyloro-spasm," which acts to prevent food from passing out of the stomach.

Stomach disturbances may be divided into four groups: (1) Where general conditions cause stomach symptoms that for a time obscure the actual disease. The gastric manifestations of cardiac insufficiency and arteriosclerosis may be treated as a primary trouble. The same may be said of the dyspepsia of chronic nephritis. An ulcer may be diagnosed when a cirrhosis of the liver causes a gastric hemorrhage. The gastric crisis of locomotor ataxia has precipitated not a few operations. (2) This group includes gastric disturbances due to diseases more or less related; atonic dyspepsia, prolapse, and gastric neurosis. These are nonsurgical cases. (3) Disturbances of the stomach caused by appendicitis, gallstones, intussusception, etc. All these are to be treated by their own proper surgery. (4) There remains a small group in which the stomach actually has a surgical disease. In the main these are ulcer and cancer.

The diagnosis of suspected stomach troubles is best made by elimination, starting with the first class and going through the others to the fourth.

The author is of the opinion that the advance in diagnosis of gastric diseases made by the use of the stomach tube has not been in proportion to the great amount of effort expended in its use, and the laboratory findings are often misleading unless checked up by surgical and other diagnostic methods.

Surgery has demonstrated that fully 75 per cent of ulcers are in the duodenum and not in the stomach, as formerly supposed.

Cancer of the stomach is the most common of all cancers, and it is amenable to surgical treatment with good hope of cure if taken early. The trouble is that cancer does not cause characteristic signs in the early and most curable period. It is when obstruction occurs or when a tumor can be demonstrated that a diagnosis is made.

The author does "not believe the general position can be assailed which assumes that all cases in which there is mechanical interference to the progress of food, or a demonstrable tumor, should receive surgical consideration. A suspicion that there is cancer of the stomach should above all things lead to surgical consultation. These cases have no more business in the medical wards than has cancer of the lip, breast, or uterus."—(E. T.)

MOSCHCOWITZ, A. N. **Dry Iodine Catgut.** Annals of Surgery, January, 1911.

For the past six years catgut, prepared by the iodine method, has been in use at the Mount Sinai Hospital, New York, and has been found sterile constantly.

The method of preparation differs from that of Claudius in that an alcoholic solution is used instead of an aqueous. The mode of preparation is simplicity itself. Ordinary catgut, just as it is received from the dealers, preferably of the dark, unbleached varieties, is wound on glass spools and fastened at both ends so as to prevent unraveling. It is then placed for five days in a 5 per cent alcoholic iodine solution in a tightly closed vessel. On removal it is spread on a sterile towel covered by another sterile towel to facilitate drying, and is finally kept in a sterile container.

Numerous bacteriological examinations have been made to test the sterility of the gut after it has been prepared. It is not only sterile, but it inhibits the growth of bacteria that come near it, as shown in experiments in which Petri dishes were inoculated by parallel streaks of the following bacteria: *B. subtilis*, *B. coli*, *B. pyocyaneus*, *B. anthracis*, *Staphylococcus pyogenes aureus*, and *albus*, and *Streptococcus*. Across the inoculated streaks were placed pieces of the dry iodine catgut and the dishes were then placed in the thermostat. On the following day there were no colonies near the catgut and the sterile area was larger than in dishes inoculated in the same manner but in which the catgut prepared by the aqueous method had been used.

The conclusions arrived at are—

1. The dry iodine catgut is absolutely sterile.
2. It is impossible to infect it by ordinary means.
3. The inhibitory effect of the iodine is not sufficient to act as an irritant to the tissues.
4. Its tensile strength is superior to catgut prepared by other methods.
5. It is easily and cheaply prepared.
6. It is absorbed only after it has served the purposes for which it was intended.—(R. S.)

GIBSON, CHARLES L., M. D. **Disinfection of the Skin by Tincture of Iodine.** Annals of Surgery, January, 1911.

The author has used the method of skin disinfection by means of tincture of iodine since 1908. In October, 1909, he adopted it as a routine method of sterilization of the skin in both his private and hospital practice.

In the year ending October 1, 1910, in his service at St. Luke's Hospital, New York, the skin was disinfected by the iodine method in over 1,000 cases. About the only infections occurred in cases of suppurating salpingitis.

The author states that his results with the iodine method are fully as good and probably better than with any other known means of

skin disinfection. It is more efficient in emergency cases; it is absolutely simple; saves time, labor, and the expense of dressings before operation. It avoids the discomfort and physical disturbance of the patient during a preparation.

Two methods are used at St. Luke's Hospital.

First method.—Bathe and shave operative area on the day before operation. After primary anæsthesia the operative area is exposed and painted with one coat of the official tincture of iodine, applied with a gauze wipe; this coat is allowed to dry spontaneously; the greater the degree of dryness the less easily the iodine will be removed by subsequent handling. The area painted with the iodine should remain uncovered during the drying. At the end of the operation a light coat is applied immediately to the sides of the wound.

Second method.—This is used in cases that demand immediate operation. No water or watery solutions are allowed to come in contact with the skin. If shaving is necessary, it must be done without the use of water.

The author quotes Grossich's experiments, in which primary union was obtained in dirty cases with no washing, and infections followed ordinarily clean surfaces plus washing before the application of iodine.—(R. S.)

JORDAN, ALFRED C., M. D. **The Röntgen-Ray examination of the œsophagus.** Proceedings, Royal Soc. of Med., December, 1910.

The writer states that the most satisfactory views of the œsophagus are to be obtained from an oblique direction, the patient being placed in an upright position on a revolving saddle with a canvas back while he drinks large quantities of a thick emulsion of carbonate of bismuth. Gelatin capsules containing the dry carbonate may also be used, or the carbonate may be mixed with bread and milk and swallowed by the spoonful. The X-ray tube should be mounted in a box or shield which can be raised or lowered and should have an adjustable diaphragm with a vertical rectangular slit. The observer should be protected, as in all X-ray work, by a lead screen with sliding lead-glass panel. For detailed description of this apparatus the author refers the reader to Archives of the Röntgen-Ray for August, 1909. He calls special attention to the great advantage of a double foot switch with which, by merely raising the foot, the current is broken and the room is lighted.

He classifies œsophageal obstructions as (1) spasmodic, (2) cicatricial, (3) foreign bodies, (4) œsophageal piles, (5) new growths in the walls, (6) tumors without the œsophagus, (7) aneurism.

The best results are obtained with the thick bismuth carbonate emulsion, which shows by its progress or arrest, the thinness of its stream, or its accumulation in distended pouches the position and condition of the œsophagus. Not only are diverticula shown, but perforations into the mediastinum and bronchial fistulæ. The article is illustrated with 5 diagrams and 11 skiagrams of interesting cases.—SURG. J. F. LEYS.

SELLENINGS, A. E. **Solitary Perforation of the Ileum Associated with Strangulated and Obstructed Hernia.** Am. Jour. of Surg., October, 1910.

Two cases of hernia were reported that became strangulated, but were reduced with little damage to the gut. Subsequently, in each case, there appeared a small perforating ulcer in the intestinal wall several inches above the site of strangulation. The perforations were surrounded by perfectly healthy intestines and mesentery and appeared to be punched out of normal tissue.

The author states:

For an explanation of this interesting lesion we must turn to Kocher, who states that the common cause of death in all forms of obstruction by strangulation as well as by stricture, whether acute or chronic, is not due to such strangulation with local gangrene and ulceration, but by lesions in the intestinal wall above the seat of obstruction. These lesions consist in the formation of circumscribed necrosis of the mucous membrane, going on to sharply circumscribed ulceration through the whole thickness of the wall, giving rise eventually to perforation. The cause of these ulcerations is not, as has been described, due to the presence of hard fecal masses pressing for some time on the same spot: neither is it due to any lesion of the mesenteric vessels. The same lesion of ulceration is found in the ileum and jejunum, where the bowel for the most part is filled with liquid contents. Kocher has experimentally distended the bowel with gas and fluid and has produced the same lesions. By such distension and without the slightest interference with the mesenterial circulation, the bowel becomes quite blue by reason of venous stasis. As a consequence of this, ecchymosis may form in the mucous membrane, the nutrition is altered, and the protective influence of the epithelium (Cassin and Charrin), which has been proved to be of such importance, is destroyed. Under the influence of the increasing venous stasis and of the absorption of the increasing toxic products, there results a necrosis of the mucous membrane (beginning at the above-mentioned ecchymotic spots) going on to ulceration and perforation.—(E. T.)

TENNEY, BENJAMIN. **The time and method for prostatectomy.** Boston Med. and Surg. Jour., January 26, 1911.

Residual urine is the most important point in the diagnosis of an obstructing prostate. The size of the gland itself is of less importance. Often a very slight enlargement causes more obstruction than an enormous hypertrophy, and cases really become pathological only at the moment when the bladder can not be entirely and voluntarily emptied.

With the residual urine start the usual train of symptoms: Frequent, difficult, and night urination, cystitis, infected bladder, albuminuria, thickening and contraction of the bladder walls.

Difficulty in passing a catheter may be due to several causes, but if the catheter passes easily and residual urine is found the diagnosis of prostatic obstruction is certain.

The author advocates early operation, just as soon as the presence of constant residual urine can be demonstrated, because a permanent anatomical condition is then present whose certain outcome is pathological change in the bladder, ureters, and kidneys.

In hypertrophy without any residual urine there is nothing to be gained by any operation.

Early prostatectomy when the bladder is aseptic and of normal capacity is better than a later operation on a small, thick-walled and inflamed organ.

The frequency of malignant diseases in an hypertrophied prostate is another reason for early and complete removal.

The presence of cystitis is no bar to surgical intervention, because the operation will really cure the cystitis and, what is more important, will allow the ureters to drain into a clean bladder instead of their orifices being constantly submerged in a purulent pool.

In the large group of men who secure comfort in the daily use of the catheter the operation is largely one of choice of the patient himself. However, such cases are ideal for operation because of the proved resistance for infection and tolerance to rough treatment.

In these cases the danger line is reached when the frequency of catheterization begins to increase. This is an indication of beginning infection and contraction. These cases go from bad to worse more rapidly than all others.

As to method the author prefers the suprapubic for the following reasons: (1) The tumor is more or less intravesical. (2) The largest prostate can be removed entire or in two pieces without injury to rectum, sphincter, or ejaculatory ducts. (3) Recent studies of hypertrophied prostates show cancer to be comparatively frequent and morcellation is therefore undesirable.—(E. T.)

LESPINASSE, V. D., FISHER, C. C., and EISENSTAEDT, J. **A Practical Mechanical Method of End-to-End Anastomosis of Blood Vessels.** Journal Am. Med. Assn., November 19, 1910.

This unique operation is performed by the use of metallic magnesium rings or flanges, and depends on the fact that the metal is decomposed by the fluids of the body and disappears in about 100 days. In the destruction of the magnesium hydrogen is slowly liberated, but is absorbed without any harm.

As a first step the vessel must be freely exposed, and the sheath and loose tissue dissected away. Then while the artery or vein is still intact the diameter is measured and rings of the same size selected. The vessel is then clamped just tightly enough to stop the blood flow and is cut between the clamps. If the walls retract within the adventitia the latter must be cut flush with the artery wall. All clotted blood must be washed away with salt solution.

The authors have devised several methods of applying the rings, the essential feature being the formation of flanges by placing the rings over the cut ends of the vessel, spreading the walls on the surfaces of the rings and bringing the internal coats of the vessels together and uniting the rings through holes for the passage of ligatures.

The intimas of the vessels must be approximated with just sufficient pressure to prevent leakage. It has been found that a pressure of 5 pounds will stop hemorrhage without injury to the intima, while a pressure of 8 pounds will crush it.

The experimental results on the common carotid and external jugular were perfect, union taking place and the rings disappearing in about 100 days.

The accidents and bad results common to surgical work on blood vessels did not occur in these series, such as follows:

Thrombosis.—In this method there is nothing inside of the lumen of the vessels after the operation is completed; hence if trauma to the intima is avoided during the operation and the vessel is washed free from all clots and not tied tightly enough so that the rings will cut the intima where it bends outward to form the flange, thrombosis will not occur. Secondary thrombosis, such as occurs in the Payr operation from pressure necrosis, is impossible.

Stricture.—In this method primary stricture can not occur if the vessel is accurately measured and an appropriate-sized ring is at hand with which to make the anastomosis. Secondary stricture has never occurred in any experimental operations. In one specimen there was a small pouch at the site of operation.

Hemorrhage.—Primary hemorrhage should not occur. In most of the anastomoses there is absolutely no hemorrhage, not even a drop; secondary hemorrhage has occurred only in the presence of infection.

Embolus.—There is danger of this occurring only when thrombosis is present: hence to avoid embolus, avoid thrombosis. Its seriousness depends entirely on the point of lodgment of the embolus.—(E. T.)

HYGIENE AND SANITATION.

Medical Director H. G. Beyer and Surg. C. N. Fiske, United States Navy.

Foulds, Mark. **Sterilization of Water on a Large Scale by Means of Ultra-violet Rays.** Jour. of the R. A. M. C., Vol. XVI, No. 2, February, 1911, pp. 167–177.

Although most of the processes employed in the purification of water aim more or less directly at the destruction of germ life, it

must, perhaps, be admitted that a method which would destroy only the obnoxious pathogenic germs, leaving the other qualities of a natural water unaltered, would be a more ideal method for producing an agreeable and safe water for drinking purposes.

All the different processes employing either heat, sand, chemicals, or ozone have, it appears, found a very serious competitor in the methods of treating water with ultra-violet rays ever since it was demonstrated that these methods are not only safer but also simpler and cheaper.

It is now almost general knowledge that dangerous microbes in water are killed with quite remarkable speed by means of the ultra-violet rays. Quartz mercury vapor tubes were first applied to illuminating lamps, it being well understood that the tubes were inclosed in glass tubes, so as to protect the public against the enormous quantity of ultra-violet rays which pass through the fused rock crystal, of which the tubes themselves are made. Such tubes are now being used for purposes other than illumination.

The first apparatus developed, known as the Westinghouse sterilizer, gives in the simplest possible manner a continuous supply of sterile water at the rate of 130 gallons per hour. The normal illuminating lamp, consuming 3.5 amperes at 110 volts, is suspended in the apparatus, immediately above the surface of the water. The apparatus is enameled white, giving a good reflection of the rays, thus increasing the efficiency. The water in the apparatus is kept under violent agitation and is exposed for about five seconds to the influence of the rays from the lamp. The water leaves the apparatus in the same condition that it enters it, with the exception that all life is annihilated. Experiments have shown that sufficient sterilization of drinking water could be obtained with a maximum expense of 36 watt-hours per cubic meter. The table which accompanies the account of these observations shows that the quantity of water which passed through this apparatus was in nearly every case more than 600 cubic meters, or 132,000 gallons per 24 hours, and was found sterile in the majority of cases.

The tests carried out by independent authority have clearly demonstrated the possibility of producing a perfect drinking water for public distribution with a consumption of 26 watt-hours per cubic meter, a single apparatus being capable of treating fully 600 cubic meters in 24 hours.

In view of the extreme simplicity of the apparatus and the low power consumption, it would appear that there is a wide future for this new system of water sterilization, even on board ship.—(H. G. B.)

Sterilization of Water on a Large Scale by Means of the Ultra-violet rays. Lancet (Lond.), December 17, 1910.

In an unsigned article the merits of an improved apparatus are based upon selected analyses of water naturally and artificially contaminated with *B. coli* before and after "sterilization" and upon such apparently accepted facts as the comparative imperviousness of glass to ultra-violet rays.

After recounting the disadvantages of purification of polluted water by sand filtration, chemical agents, and ozone, the development of the Finsen lamp and the mercury-vapor lamp for illumination leads to a description of the standard unit device.

From the valved supply main the water passes over a deviating mushroom valve with solenoid which automatically lifts when for any reason the current fails; thence the water flows by five alternating centripetal and centrifugal baffle plates in a semicylindrical iron box so that it receives an essential stirring and the entire volume comes at three stages under the direct influence of the light rays emitted from an axially placed quartz (rock crystal) box containing one 3-ampere 220-volt Cooper-Hewitt lamp. It is stated that "this unit will sterilize at least 600 cubic meters (132,000 gallons) in 24 hours * * * with consumption of 26 watt hours per cubic meter." *B. coli* was found absent (in 200 cubic centimeters) in the nine experiments tabulated, although in seven the organism was present before exposure in from 50 to 1,000 organisms per liter. Other bacteria were reduced from a maximum before exposure of 260 to a maximum after of 10 per cubic centimeter. In 28 analyses out of 41 the effluent proved sterile; in 8 analyses molds were increased and in 5 others they appeared, although absent before entering the apparatus "due to the lack of protection of the opening from which the [purified] test water was drawn." The water used in the competitive Marseilles test was obtained from the muddy Durance River, being first clarified by Puech and Chaball roughing filters and prefilters: a perfectly clear water, in fact a "perfect" water, "according to Miquel's definition," was said to be the invariable result.—(C. N. F.)

THRESH, J. C., M. D., D. Sc., and BEALE, J. F., M. R. C. S., D. P. H. **The Practical Sterilization of Potable Waters by Means of the Ultra-violet Rays of Light.** Lancet, December 24, 1910

Confirmatory of the recent findings of Sedgwick and MacNutt of Boston, that the Mills-Reincke phenomenon has a basis in fact and is explained by Hazen's theorem that the substitution of a pure for an impure water supply is followed almost invariably by a decrease in the general death rate and by a special decrease in the death rates from typhoid, diarrhea, phthisis, pneumonia, and infantile

diseases, these authors have taken for their text the reduction in general death rate of Newark, England, for the five years following the introduction of a purer water supply comparable with that experienced at Albany, N. Y., since 1900.

Most of the attempts to improve upon the slow sand filtration systems have been failures, but three other methods hold out great promises for the future:

The *ozone* process labors under the disadvantage of requiring an exceedingly complex electrical installation, which requires specially skilled supervision. The *chlorine* process suffers temporarily from sentimental objections. When these are overcome, as doubtless they will be since such treated waters are now being used for public supplies, the process will probably be largely adopted, especially when a cheap supply of electricity is not available. The *ultra-violet rays of light* process is not subject to any of these disadvantages. Where electricity is available an installation of a very simple character, requiring very little supervision, can be laid down; and if the results already obtained can be maintained for long periods, the process should have a great future before it, since it can be used for purifying the supply of a single house as well as for the purification of the supply to the largest city.

Two apparently rival apparatus differ chiefly in having the Cooper-Hewitt mercury vapor lamp immersed or not immersed in the water to be purified. The lamp is inclosed in a fused silica box instead of glass, which is said to absorb the specially active rays. The Nogier lamp is immersed on the theory that—

The intensity of the action varies inversely as the square of the distance from the source of light, * * * and this is supported by the results of experiments * * *. It is also claimed that with a given amount of electrical current much more water can be sterilized than with an external lamp; that the lamp being kept cool will last longer; and that the apparatus can be made smaller, more compact, and automatic. The advocates of the external lamp say that the immersed lamp is more liable to fracture, and that in time it will become covered with calcareous deposit and lose its efficiency. On the other hand, it is affirmed that the difficulty which at first occurred from breakages has been surmounted, and that any calcareous deposit which may form can be easily removed with dilute acid; and it is alleged that the external lamp, on account of the heat engendered, becomes affected to such an extent that its sterilizing effect is speedily decreased owing to some molecular change in the internal surface of the fused silica. Time, however, is necessary in order to demonstrate the truth or otherwise of these allegations.

After referring to experiments with the apparatus [described in the foregoing review], these observers outline three of their own experiments, with tabulated results to show that even badly polluted water is practically sterilized, *B. coli* being invariably absent in 500 cubic centimeter quantities after exposure at rates of flow ranging from 11 to 200 gallons per hour, although the organism was present in from 20 to 100 cubic centimeter quantities before treat-

ment; chemical analysis was undertaken after protracted exposure at the rate of 10 gallons per hour, but—

the chemical constituents remained unchanged. * * * One of the samples of water treated had a faint but decided odor suggestive of sewage, whereas the treated water was devoid of odor. In this case there was a slight reduction in the free ammonia [and slight increase in albuminoid ammonia]. This was an exceedingly impure water, yet it was found that the apparatus practically sterilized it.

The temperature of the water was raised from 0.2° to 2.2° C., depending upon the rate of flow.

Experiments on a much larger scale are soon to be commenced.

There is little doubt that for small installations and for suitable waters [turbid waters require prior filtration], when electric current is available treatment with ultra-violet rays will be more economical than any other process yet devised, but it remains to be seen whether, under such circumstances, it will be able to compete with the chlorine process as now simplified and improved.

One process will doubtless be practicable or preferable where the other would not. At any rate, communities need no longer use dangerous water when, by either the ultra-violet ray or the chlorine process, it may be "rendered safe at the cost of much less than a penny per 1,000 gallons."—(C. N. F.)

GATTI, T., DOTT, Capitano medico nella regia Marina. **Nota sulla Carne Refrigerata e sui Refrigeranti dei Piroscafi.** (Note on cold-storage meat and on cold-storage chambers on steamers.) (Annali di Med. Navale e Coloniale Anno XL–1910–Vol. 11, Fasc. VI. Dicembre, page 633.)

Meat as it comes out of cold-storage chambers very often presents not alone a dirty outside appearance, but also shows evidences of a deeper-seated rottenness. The author very carefully studied the methods of slaughtering and has no fault to find with them. Nor does he attribute the cause of decay in cold-storage meat to the process of freezing, having frequently noted meat in the most perfect state of preservation, after several voyages, come out of the freezing chamber. Fishes and poultry, whether drawn or not, were found to be well preserved and taken out of freezing chambers in the same state in which they were when put into them.

The author believes himself warranted in stating that the freezing chambers as commonly in use on steamers fulfill their function well and that whenever the meats are taken out spoiled they must have been in that condition when put in. Cold, while preventing decomposition, does not stay the process completely after it has once begun. The damage occurs during transport, a time when injuries and contaminations usually occur due to unhygienic handling. I

recommends that the meat be most carefully handled during transport from shore to ship on meat boats instead of being hoisted on derricks and dumped through the hatches. He maintains that the use of cold-storage meats on board steamers is always to be preferred to the old method of taking live animals on board.—(H. G. B.)

CLURMAN, M. J., A. B., M. D. **The American Game of Football; is it a factor for good or for evil?** Med. Record, January 7, 1911.

The author, declaring himself to be a true lover of athletics and outdoor sports, and believing that the game can not be "reformed" sufficiently without emasculation and becoming a hybrid form of basket ball, answers his question with a detailed and emphatic denial of good and affirmation of evil consequences.

The following table is constructed from such serious accidents as certain newspapers chanced to chronicle since football was reformed:

Years.	Deaths.	Serious injuries.
1905	26	(?)
1906	11	103
1907	11	97
1908	13	84
1909	33	73
1910	19	400
	113	757

Grand total serious accidents recorded, 870.

Dr. R. E. Coughlin classified the causes of death for 1905 as follows:

Abdominal injuries	7
Dislocation of spine, with paralysis	3
Concussion of brain	5
Fracture of skull	5
Cerebral hemorrhage	2
Fracture of rib (penetrating heart)	2
Fracture of spine	1
Acute peritonitis	1

Clurman justly remarks that of all college sports, including baseball, track athletics, hockey, lacrosse, basket ball, cricket, rowing, tennis, golf, swimming, and wrestling, the one which constantly endangers life and health is football.

President Eliot's views of the game are quoted:

It causes an unreasonable number of serious injuries and deaths. Not 1 in 5 of the men that play football several seasons escapes without injury properly called serious, and of the 20 to 30 picked players who play hard throughout a season hardly a man escapes injury. * * * Although the game of football has been made more open and interesting by the new rules and some of the foul play has been prevented by the neutral strip and other devices, the game still

remains unfit for college uses and affords a demoralizing spectacle for the immense crowds which gather to witness the chief games. It is reasonable to expect that the barbarous stage of public opinion and college opinion concerning athletics, which in this country has been partly the result of inexperience in competitive sports and partly of the general predisposition to exaggeration in pleasures which characterizes Americans, will pass away before many years.

The player rushing with ball tightly clasped to his chest can not protect himself from sudden impact with his opponent or the ground. "Interference" and strenuous encounter spell more or less traumatism up to the time of the official's "down." The fatigued, tottering and fainting condition of the players should signify exhaustion even to the layman. Weak and irritable hearts with hypertrophied muscles characterize the player, while myocardial degeneration from disuse, with later aortic disease and lack of resistance for new strains and diseases, are familiar consequences. "Daily graded and moderate exercises" for the whole student body should be demanded by medical advisers. President Butler and Columbia are commended for abolishing the game, while Harvard and Yale are called upon to take the same stand and thereby eliminate football probably from all colleges and schools. The familiar psychological, ethical, and academical objections are recounted, although admittedly of more direct concern to the sociologists.—(C. N. F.)

BUNKER, J. W. M., A. M. **The Hygiene of the Swimming Pool.** Am. Jour. Pub. Health, November, 1910.

Experiments were undertaken to remove the possible dangers of infection from the swimming pool of Brown University; its capacity is approximately 75,000 gallons; it is emptied, cleaned, and filled from city mains every three months; temperature maintained at 68° F. Owing to financial necessity of using the same water repeatedly, a gravity sand filter, which clogged and proved otherwise inefficient, was installed in 1903. In 1908 a settling basin and new 6-foot sand filter was installed, graded from 2-inch crushed rock to fine sand.

The water from the pool is at present drawn off at the rate of 125 gallons per minute and pumped into the sedimenting tank, where once a week 3 pints of alum are added as a coagulant. The course of a particle of water through this tank is about 20 feet, due to the arrangement of baffle beams. The outflow is spread through a butterfly valve over the surface of the sand filter, whence it goes down through and into the pool. Under this system an amount of water nearly equivalent to the content of the pool is passed through the filter each day, the pump being run from 9 a. m. to 6 p. m. This method of filtration keeps the water in the pool clear and of good color, but has little effect on bacterial content, although the efficiency of the filter is good.

Plated samples on agar at 37° C. yielded 300 to 1,000 colonies for each cubic centimeter, depending upon depth and normal agitation of sediment. With the possible exception of nasal and aural affections, no disease has been attributed to the tank. The possibility of a typhoid or other disease "carrier" dangerously infecting the water led to chlorine disinfection. Experiment with 2-liter samples containing 700 bacteria per cubic centimeter, treated with calcium hypochlorite, 1 part of available chlorine per million of water, resulted in absolute sterilization in 15 minutes. With half the above proportion of lime, 4 out of 6 samples were sterile in 15 minutes, the other 2 samples giving 1 colony per cubic centimeter.

The pool was treated with calcium hypochlorite in the strength yielding 1 part available chlorine to 2,000,000 of water without perceptible odor or taste. "The lime was finely pulverized, placed in a cheesecloth bag, and dragged about the pool until distributed. Surface samples before disinfection yielded a count of 500 per cubic centimeter. Three samples after 15 minutes yielded a count of 30 per cubic centimeter. After 30 minutes the count was 10. After 1 hour there was complete sterility." Eight hours later, after use, the count was 5 per cubic centimeter. [Using the calcium hypochlorite furnished in the Navy, from 750 to 1,000 grams would be required for 100,000 gallons, depending upon the apparent freshness of the lime.]—(C. N. F.)

SIMPSON, R. J. S., C. M. G., Lieut. Col., R. A. M. C. "**Cordite Eating.**" Medical History of the South African War. Jour. R. A. M. C., Vol. XVI, No. 1, January, 1911.

A special report by Jennings and Morton is quoted to show that shortage of matches during the Boer War seems to have led soldiers to extract cords from cartridges for the lighting of pipes and cigarettes, which furnished one of the extraordinary and unlooked for side results of the war—the habit of cordite intoxication.

The drug is taken in two or three ways, e. g., eaten solid, boiled down in water or tea, or mixed with beer.

In small doses, to those unaccustomed to its use or to other narcotics, cordite, like some other drugs, has a by no means pleasing effect, as Maj. Jennings found, to his cost, on eating a quarter stick by way of experiment. The stuff was sweet in the mouth, but it gave him a "most racking, splitting headache." The habitué is able to take the contents of a cartridge or more. His face flushes, head throbs and seems to swéll, and then, in about 15 minutes, comes long, deep sleep. On awakening he has an intense headache, thirst, etc. Taken with beer or hot tea, the first effects are wild, delirious intoxication, and this is followed by sleep. Morphia, opium, and alcohol in small quantities are "pick-me-ups" after cordite, and apparently some men have used cordite as a reviver after alcohol. Optical and mental delusions, timidity, weakness, and general breakdown, moral and physical, result from prolonged use of cordite as a drug.—(C. N. F.)

CHICK, H., D. Sc. **The Process of Disinfection by Chemical Agencies and Hot Water.** Jour. of Hyg., vol. 10, No. 2, August, 1910.

In support of her contention recorded in 1908 (Jour. of Hyg., VIII, 92) that if the disinfectant be present in large excess relative to the bacteria, disinfection proceeds in accordance with a logarithmic law in the same manner as a reaction of the first order, and the interpretations of which were assailed by Eijkman and by Hewlett in his Milroy lectures, Chick gives further tables and plotted figures which tend to show "that disinfection is an orderly time process which may be considered analogous to a chemical reaction," such as the decomposition of hydrogen arsenide, the inversion of sugar, etc. Using 0.6 per cent phenol and 0.08 cubic centimeter of a 24 hours broth culture of either *B. typhosus*, *B. coli communis*, or *S. pyogenes aureus* at 20° C. and withdrawing a definite number of drops for agar and preferably gelatin plate cultures at successive intervals of time the velocity of disinfection at any moment is found to be proportioned to the concentration of surviving bacteria; comparing present results with her former work with the spores of anthrax and *B. paratyphosus*, it is shown that the logarithms of concentration of survivors are plotted in straight lines with the exception of *B. coli communis*, with which the disinfection is delayed for the first four minutes, and *B. paratyphosus*, if young, with which the velocity is accelerated for a similar first interval; retardation in the former case is suggested as being due to time taken for the disinfectant to penetrate the bacterial envelope, and the initial excessive velocity of disappearance of *B. paratyphosus* is attributed to exhaustion of the medium; for with the third generation of three hours' cultures there resulted an approximate conformity to the logarithmic law.

The same law appeared to govern disinfection with hot (45° to 55° C.) water in the case of *B. typhosus*, *B. coli communis*, and *B. pestis*, while with *B. paratyphosus* there occurred the same velocity in excess of the theoretical which was encountered with phenol: the plotted logarithms of surviving concentrations of *S. pyogenes aureus* showed the greatest variability, including the ideal straight line and the tendency to lag found with phenol.

The velocity of disinfection as related to temperature is also shown to proceed in accordance with logarithmic law, the temperature coefficient for *B. typhosus* being 1.635 for 1° C., or 136 per 10° C., this high figure being "comparable to that obtained for precipitating of proteins with hot water" and supporting the view that disinfection of bacteria by this means is due to heat coagulation of their constituent proteins.

The addition of even minute quantities of acid or alkali (rendering the solution N/7000) for *B. typhosus* at 54° C. increased the

mean rate of disinfection one and a half to two fold with alkali and five to seven fold with acid.

Disinfection by drying and sunlight appear to "fall into line with the other cases of disinfection which have been investigated."—(C. N. F.)

ROSENBERGER, R. C. **Eggs: A Study of Eggs Offered for Sale as Pure Food.** N. Y. Med. Jour., December 31, 1910.

This is an exposition of methods and conditions which prevail in the egg business of a large city. Eggshells are porous and readily admit putrefactive and pathogenic bacteria, especially if there be a slight crack or a part of the shell is in contact with moisture. Provided the eggs are strictly fresh, they may be legitimately preserved for future use by submerging in salt solution or limewater, packing in sawdust or bran, or by coating thoroughly with paraffin, petrolatum, or with sodium or potassium silicate.

Questionably fresh eggs kept in cold storage or broken up into an "egg mixture" which promptly putrefies are commonly supplied to unscrupulous bakers for cakes, pastry, and ice-cream cones. This mixture and certain desiccated granular egg products are shown by carefully controlled experiments to contain myriads of putrefactive organisms, as *B. coli*, *Proteus vulgaris*, numerous typho-colon groups resembling paratyphoid organisms, micro and streptococci, *B. prodigiosus* and *B. botulinus*, to which last-named serious attacks of gastro-enteritis have been traced.

A number of the desiccated products contain no egg but, instead, corn starch, powdered tapioca, together with anilin dye and soapbark extract for coloring and producing a "whip-easy" froth.

In so-called "fresh cracked eggs" rots, spots, and maggots were found, while the injection of small quantities of "egg mixture" made from them, whether incubated or not, caused death in six hours in guinea pigs repeatedly, *B. botulinus* being recovered. Three drops of blood from one of these animals injected into another produced death in 17 hours, the same organism of meat poisoning being found.

The following definitions of terms used among professional "candlers" seem worthy of quotation in full:

The industry of hatching eggs for Easter is the time a good many unfertilized eggs are removed from nests and incubators and put on the market as fresh eggs. In other words, eggs which do not hatch are thus marketed and are termed "heated eggs," or "spots."

There are several kinds of "spots." A spot can be referred to as a "fresh spot," because when opened after candling it appears pretty fair, but it will be seen that the white and yolk mix almost immediately or flow out together.

(It is impossible to mix the white and the yolk of a strictly fresh egg in the shell no matter how violently it is shaken.)

A "red rot" is an egg which when opened flows out entire and shows a mass of yellowish material which the candlers call "cheesy" matter. (This cheesy material may represent the degenerated germinal spot.)

A "black rot" is an egg which when opened is entirely fluid, runs or sometimes spurts when the shell is cracked, contents black in color, gives off a very penetrating, disagreeable odor, and can only be used for fertilizing processes; yet this egg makes up part of the egg mixtures.

A "moldy" egg is one which has become infected, not necessarily through a crack in the shell, but possibly by a spot or area of moisture from hay; or, packed in crates, a cracked egg may run, the cardboard separator becomes moist, an egg sticks to it, and this brings about infection of the egg. These eggs open up perfectly, but there is a very pronounced odor of moldiness or what is commonly called a musty odor. If one of these eggs is placed in a can containing other eggs it would spoil the whole mixture.

A "watery" egg is one which has a more watery white than usual, is eatable, but spoils very rapidly, when it is known as a "watery rot."

A "check" (or blind check) is one in which is the slightest, almost unnoticeable crack from a slight injury, and a professional candler while handling the eggs can detect these checks by a peculiar sound which is produced when they are slightly jarred against one another.

A "cracked egg" is one where a visible crack or cracks are noticeable, while a "leaker" is one where the whites or whites and yolks are escaping from cracks. These cracked eggs are all fit for food purposes, but must be used as soon as possible because of the danger of infection from the air.

A "grass" egg is one where the yolk shows up very perceptibly in candling, even though fresh. This egg, I believe, is received mostly from Delaware and is hard to distinguish from a "spot egg."

There are dealers who buy up these fresh cracked eggs, separate the whites from the yolks, put them in cans, and sell them to hotels and first-class bakeries. Sometimes the whole egg is sold in this way. These separated or whole products are sold by the pound.

The various forms of spots and rots can all be detected by candling, as there is the greatest difference in the appearance of a perfectly fresh egg and one which is a "spot" or a "rot" or a "moldy" egg.

A perfectly fresh egg gives a uniform pinkish color when held against a light in a darkened box or room, and the yolk is hardly discernible except in the grass egg. In the spot and rot eggs the outer or fluid albuminous layer is more evident and appears like water; in other eggs there appears a cloud or spot which may be at any portion of the egg. In the moldy egg the egg is not quite so transparent as the strictly fresh egg, and in the black rot the egg appears opaque in areas or in its entirety.

The best method of determining the quality of eggs is to have an *expert* "candle" them. The egg industry, particularly the wholesale market and bakery supply, needs careful supervision. Undoubtedly a tuberculous patient, taking numerous eggs daily, frequently sickens of them or has an enteritis attributed to the course of the disease when the supposedly "fresh eggs" constitute the cause of the trouble.—(C. N. F.)

TROPICAL MEDICINE.

Surg. C. S. Butler, United States Navy.

Urriola, Ciro L., M. D. **Upon a New Pathognomonic Sign of Malaria.** St. Thomas Hospital, Panama, Canal Zone, Semaine Medicale, No. 1, January 4, 1911.

The author points out that in many phases of malarial infection it is extremely difficult, if not impossible, to demonstrate the parasites. The search for the parasite being so often fruitless, investigators have tried to find some other pathognomonic sign. Thus the agglutinative effect of the blood serum of malarial patients upon the red blood cells of normals and Plehn's test for urobilin in the urine, as possible pathognomonic signs, are discussed, and it is shown that both these tests are found wanting. Pigment in the bodies of malarial patients, in the leucocytes, and in the blood serum is referred to, and the author thinks that a pathognomonic finding in paludism of all forms shows the existence, in the blood, of free pigment. The kidney is the principal organ which throws off this pigment, and though the examination of the blood to determine its presence is of importance, it is much easier to find the pigment in the urine. It is extremely doubtful whether there is any type of plasmodium which goes through its life cycle without producing pigment, though certain Italian authors think there may be. Manson casts doubt upon the melaniferous leucocyte as an absolute index, since in normal individuals from 20 to 50 per cent of small mononuclear leucocytes contain in their cytoplasm a few grains resembling melanin. So that the author's finding seems to be about the only absolutely pathognomonic finding, occurring only in malaria and being present in malaria of whatever type, latent as well as active.

To demonstrate the pigment in the blood take a few drops of blood into a centrifuge tube one-third full of normal NaCl solution and centrifuge for five minutes. With a pipette take material from the depth for microscopical examination. The urine is also centrifuged for five minutes and a microscopical mount made from the lowest layer. This is examined with a high power. The pigment occurs in (1) fine grains grouped in considerable numbers, (2) large polymorphous masses, (3) grains included in hyaline "plaques" or in leucocytes. Sometimes fine and medium grains are associated with large masses of pigment.

A blue pigment in grains is also visible in epithelial cells or hyaline "plaques," as well as the already well-known ochre pigment. Pigmented bodies occur in other febrile conditions and should not be confused with the malarial body which is black as Chinese ink. Furthermore, by displacing slightly the focus one can see a yellowish border which almost always has adherent to it particles of yellowish

material. They are not as abundant as the masses of malarial pigment.

The author discusses numerous cases showing the value of this finding in obscure malarial conditions.—(C. S. B.)

ROGERS, L., M. D., Prof. Path., Med. College, Calcutta. **A Simple Method for the Treatment of Cholera.** Brit. Med. Jour., September 24, 1910, and Bull. Mensuel, December 9, 1910.

Prof. Rogers uses a method of treatment in cholera, which, according to his results, seems extremely satisfactory. It consists in the injection of a hypertonic salt solution. The solution is made thus: Sodium chloride, 7.68 grams; potass. chloride, 0.38 grams; calcium chloride, 0.25 grams; sterile water, 567 grams.

The maintenance of the blood at a high pressure prevents the occurrence of postcholeraic uræmia. By administering permanganate of potash oxidation and destruction of the toxin are accomplished.

Results of treatment are indicated in the following table:

Dates.	Method of treatment.	Cases.	Deaths.	Percentage of—	
				Deaths.	Recoveries.
1895–1905	Rectal and subcutaneous salines	1,243	783	59.0	[illegible]
1906	Normal salines intravenously	112	57	51.9	[illegible]
1907	Rectal and subcutaneous salines	158	94	59.5	[illegible]
1908–1909	Hypertonic intravenous salines	294	96	32.6	[illegible]
August, 1909–July, 1910.	Hypertonics plus permanganates	103	24	23.3	[illegible]

—(C. S. B.)

BRODEN, A., and RODHAIN, J. **Traitment de la Trypanosomiase Humaine, L'Arsacetin.** Seventh prelim. com.: Archiv für Schiffs-und Tropen-Hygiene, Vol. XLV, No. 16, August, 1910.

The authors record the results obtained in trypanosomiasis by use of another Ehrlich preparation, arsacetin, which is an acetyl derivative of atoxyl, sodium acetyl-paramidophenylarseniate.

They aim to determine the validity of Ehrlich's claim as to the new drug's value and diminished toxicity as compared with that of atoxyl. Observations have been made at the camps for treatment of trypanosomiasis in Uganda and in German East Africa by other authorities. These reports award arsacetin the same value as atoxyl. Eckard, in German East Africa, reports three cases of blindness following doses of 11 grams, 14¼ grams, and 9.6 grams given in divided doses during five, four and one-half, and three months, respectively. In the authors' experiments the drug was given in 10 per cent solution in physiological salt solution, sterilized by boiling and injected under the skin or into the muscles of the buttocks.

The injections were not at all painful and doses up to 0.75 gram were well borne by all the patients. But 3 cases out of 12 who had received a single dose of 1 gram in a few hours showed symptoms of epigastric distress, an action similar to that of atoxyl.

The clinical condition of all patients was much improved; the swelling of the glands diminished, the fever fell, and the general nutrition improved, so that patients seemed to be cured.

Of the 17 cases treated 1 developed eye trouble, which ceased upon withdrawal of the drug.

Examinations of the centrifugalized blood and of the fluid obtained by puncture of the swollen lymphatic glands showed that the trypanosomes were absent from the peripheral circulation in all cases within 24 hours after the first dose, this peripheral sterilization persisting for periods varying from 15 to 30 days, in some cases indefinitely.

Assuming that the improvement in clinical conditions and the peripheral sterilization are insufficient means of determining the curative action, the authors practice and highly recommend regular examinations of the cerebrospinal fluid obtained by lumbar puncture, for the purpose of estimating the presence of trypanosomes and the cellular contents of this fluid. Hence, before pronouncing a patient cured they require that his cerebrospinal fluid return to normal, which in a previous paper they have set as not more than five small lymphocytes per cubic millimeter.

Using this method as a control they gave prolonged treatment with arsacetin in half gram doses twice a week. As a result they report seven cases cured, five improved, two a little worse, while three were considered incurable. It is interesting to note that the three incurable cases were the only cases showing more than 200 cells per cubic millimeter of cerebrospinal fluid at beginning of treatment.

Treatment by mouth was tried in two cases and produced short-lived peripheral sterilization after 12 days, with 0.10-gram doses twice a day and increasing to 0.25 gram twice a day during the last three days of this period.

They conclude that this drug has the same action as atoxyl; that large doses are not so well borne by some subjects as same doses of atoxyl; that hypodermic is superior to oral treatment; that the drug is less sensitive to heat, and solution can be sterilized by boiling.

It is their belief that combination with tartar emetic intravenously would have given better results and are making observations toward this end.

The cheaper price of the drug as compared to atoxyl is a consideration of importance where large quantities are required.—ASST. SURG. E. P. HALTON.

PATHOLOGY AND BACTERIOLOGY.

Passed Asst. Surg. O. J. MINK, United States Navy.

ANDERSON, JOHN F., and MCCLINTIC, THOMAS B. **A Method for the Bacteriological Standardization of Disinfectants.** Jour. of Infec. Dis., vol. 8, No. 1, January 3, 1911.

In 1903, Rideal and Walker proposed a method for the standardization of disinfectants using phenol as a standard. Previous to this time no scientific attempt had ever been made to establish a uniform basis for comparison, although the germicidal properties of a good many chemical substances had been thoroughly investigated, but without a fixed standard there was no means of comparing the relative values of the different substances offered for sale as disinfectants, and as a consequence great fraud was practised in the claims set forward by the different manufacturers for the value of their products, and the introduction of the Rideal-Walker method was a step forward in the right direction. Many faults have been found with this method, both bacterial and physical, and conclusions from the work of different men will show varying results in obtaining the carbolic-acid coefficient.

The Lancet method was proposed as an improvement on the above and while it is the best method now in use, still it appears to have certain very serious faults in that it requires a special medium for subculture, has no standard scale in the strength of the dilutions of the disinfectant to be tested and in the use of *B. coli* instead of *B. typhosus* as the test organism; the *B. coli* shows a greater variability in the different strains than does the *B. typhosus* and with the lesser variability of the latter organism there will consequently be less variation in the reports from the different laboratories if it be used instead of *B. coli* as the test organism. This lack of attention to the vital characteristics, physical properties, and standardization of all the facts entering into the tests is responsible for the inconsistencies in results obtained by the same and different workers in testing the same disinfectant, and since no satisfactory method can be found unless strict attention is paid to the various influences involved, the authors have proposed a method which they title "Hygienic Laboratory Phenol Coefficient," and it is a distinct improvement on all previous methods.

As media, 10 cubic centimeters of standard extract broth are used both for the culture to be tested and for the subcultures made after exposure to the disinfectant. The broth is made from Liebig's extract of beef and it is very important that it have a reaction of plus 1.5 since a reaction greater or less than this exerts a decided inhibiting action upon the growth of the transplanted organism.

As test organism a 24-hour-old broth culture in standard extract broth of the *B. typhosus* (Hopkins) is used, and before beginning the

test the culture should be carried over 24 hours on at least three successive days. Before being added to the disinfectant the culture is well shaken, filtered through sterile filter paper, and placed in a water bath until brought to the standard temperature of 20° C.; this temperature being adopted for all the experiments, the cultures and disinfectants are brought to 20° C. in a specially devised water bath.

One-tenth cubic centimeter of the culture is used with 5 cubic centimeters of the disinfectant dilution, and the amounts are measured with a graduated pipette. For making the transfer of the culture after exposure to the disinfectant, a platinum loop 4 millimeters in diameter of 23 United States standard gauge wire is used, and it is convenient to have at least six loops. After the exposure the subcultures are incubated 48 hours at 37° C.

For the dilutions of the disinfectant a 5 per cent solution is made by adding 5 cubic centimeters to 95 cubic centimeters of sterile water. For those disinfectants which do not readily form a 5 per cent solution a 1 per cent stock solution is used. For the phenol controls a standard solution of pure phenol (Merck) is made and standardized by the U. S. P. method to contain exactly 5 per cent of pure phenol by weight, and from this stock solution the higher dilutions are made fresh each day for that day's test.

With 5 per cent stock solution the following scale has been adopted for making dilutions:

For dilutions up to 1:70 increase by a difference of 5 parts of water.
From 1:70 to 1:160 increase by a difference of 10 parts of water.
From 1:160 to 1:200 increase by a difference of 20 parts of water.
From 1:200 to 1:400 increase by a difference of 25 parts of water.
From 1: 400 to 1:900 increase by a difference of 50 parts of water.
From 1:900 to 1:1,800 increase by a difference of 100 parts of water.
From 1:1,800 to 1:3,200 increase by a difference of 200 parts of water, and so on if higher dilutions are necessary.

The seeding tubes are glass test tubes 1 inch in diameter and about 3 inches long, with round bottom and held in a suitable wooden block. It is convenient to use a wooden block containing 6 rows of 15 holes each for the disinfectant and a separate stand for the phenol controls. The tubes are marked with the strength of dilution each contains and placed in consecutive order in the stands; the measuring of the dilution being completed, the tubes are placed in the water bath to stand until the standard temperature is reached.

For the subculture tubes wooden racks with 5 rows of 14 holes each are used, and as plants are made from each mixture of culture and disinfectant every 2½ minutes up to 15 minutes, 6 tubes are required for each dilution, and in conducting the test the stronger solutions of the disinfectant and phenol are tested first, as it will not be necessary to plant them after 7½ minutes. The weaker solutions are then done and are planted every 2½ minutes for 15 minutes.

To determine the coefficient, the figure representing the degree of dilution of the weakest strength of the disinfectant that kills within 2½ minutes is divided by the figures representing the degree of dilution of the weakest strength of the phenol control that kills within the same time. The same is done for the weakest strength that kills in 15 minutes, and the mean of the two figures is the coefficient.

A study of the following chart will give the principles of the whole method:

Date, May 18, 1910.

Name, "A."

Temperature of medication, 20° C.

Culture used, *B. typhosus*, 24-hour extract broth, filtered.

Proportion of culture and disinfectant, 0.1 cubic centimeter plus 5 cubic centimeters.

Organic matter, none; kind, none; amount, none.

Subculture medium standard extract broth; reaction, plus 1.5; quantity in each tube, 10 cubic centimeters.

Sample.	Dilution	Time culture exposed to action of disinfectant, for minutes—						Phenol coefficient.
		2½	5	7½	10	12½	15	
Phenol	1:80	−	−	−	.....	.....	.....	375+ 80= 4.6875
	1:90	+	−	−	−	.....	.....	650+110= 5.9090
	1:100	+	+	+	−	−	−	
	1:110	+	+	+	+	+	−	10,5965
Disinfectant "A"	1:350	−	−	−	.....	.....	.....	10.5965÷2=5.2982, or the "coefficient."
	1:375	−	−	−	.....	.....	.....	
	1:400	+	−	−	−	.....	.....	
	1:425	+	+	−	−	−	−	
	1:450	+	+	−	−	−	−	
	1:500	+	+	−	−	−	−	
	1:550	+	+	+	−	−	−	
	1:600	+	+	+	+	−	−	
	1:650	+	+	+	+	+	−	
	1:700	+	+	+	+	+	+	
	1:750	+	+	+	+	+	+	

—ASST. SURG. J. J. O'MALLEY.

DIXON, SAMUEL G., M. D., FOX, HERBERT, M. D., and RUCKER, JAMES B., M. D. **Microorganism Found in the Blood of Acute Cases of Poliomyelitis.** Laboratory Report, the Department of Health, Commonwealth of Pennsylvania.

In examining the blood from acute cases of poliomyelitis in human beings and also in monkeys, in which the disease was produced experimentally, an organism was found, different in morphologic characteristics from any heretofore described, which may or may not on further investigation prove to be the etiological factor in the causation of the disease. Blood smears being fixed in methyl alcohol for one minute and stained with carbol-thionin, the organism appears as a faintly stained blue rod, with regular cell wall about 10 micron long and about 0.8 micron in width, curved at an angle of 60° to 75° at one end, occasionally at both ends. At times the curved end is bulbous. Some of the organisms appear to have a very finely granular protoplasm when the highest amplification is employed. They may be discerned by means of a 4 mm. dry objective, but their characteristics are much more satisfactorily delineated

under the 1-12 oil immersion lens. They are found free in the serum as well as within the body of the red blood cell.

The organisms do not retain the violet color when stained by the method of Gram, but assume the color of the counter stain which, as generally used in this laboratory, is a very dilute solution of carbol fuchsin.

The bloods examined were from 10 different cases of acute poliomyelitis in children and were taken during the epidemic of last summer and autumn, and from 13 cases of the disease during the acute stage, which had been produced experimentally in as many monkeys.

Blood smears from three normal human beings were carefully examined and, although the search for these organisms was diligently made, none were found. Smears were made from the bloods of 13 normal monkeys with negative results. After inoculation with the virus these same monkeys gave positive results. The blood of other normal monkeys gave negative results.

Blood smears were stained with iodine and sulphuric acid in order to test the organisms for cellulose, but no blue-stained organisms were seen.

Smears from the cords and brains of paralyzed monkeys and from one human case were examined, but none of the new organisms were found.

Filtered virus stained with carbol-thionin and by Gram's method showed none of these organisms.

Defibrinated blood, 3 weeks to 2 months old, from 2 paralyzed monkeys showed the forms in increased numbers.

Cultures made from the blood of a paralyzed monkey in blood bouillon, plain bouillon, and blood agar, examined after having been inoculated three weeks, showed the presence of the organism in increased numbers. Dorsett's egg medium was inoculated with the same blood at the same time, but the organism was not found in smears from the surface of the medium or from the water of condensation.

We have searched without success for moving organisms in fresh blood, in old tubes of defibrinated blood from paralyzed monkeys, in blood bouillon, plain bouillon, serum bouillon cultures 3 weeks old, and in the condensation water in 3-weeks old cultures on Dorsett's egg medium under dark field illumination.

Success in isolating the organisms has not attended our efforts as yet.

NICOLLE, CHARLES. **Experimental Researches upon Typhus Exanthematicus Done at the Pasteur Institute of Tunis during the Year 1910.** An. de L'Inst. Pasteur, January 25, 1911.

The author reviews the work done upon typhus during 1909 by himself and refers to the two facts discovered, viz: (1) That the virus can be transmitted successfully to monkeys, and (2) that the body louse is responsible as the usual transmitting agent. He refers to the confirmatory foreign work, mostly done upon *tabardillo* (typhus fever of Mexico), by several American and Mexican workers.

This paper deals with the author's recent experiments, which show the existence of preventive properties in the serum of convalescent patients and of cured animals. They confirm the older findings of Legrain and Raynaud upon the curative power of this serum and bring to bear an indisputable experimental basis for it.

They show that we possess a method, if not general, at least susceptible of limited application, for treating exanthematic typhus.

This method is to be employed in an epidemic, where its use should be reserved for those gravely attacked or for doctors or attendants amongst whom typhus claims such a large tribute. In Africa its benefits should apply chiefly to Europeans, who are much more sensitive than natives.

In the author's opinion it is only necessary to use filtered serum. The filtration, which was done in all cases with a Berkefeld filter, not only obviates the possibility of inoculating the patient with syphilis but also prevents alteration of the serum and allows its preservation in the cold.

He points out, in closing, that the curative serum taken from convalescent patients must be taken within 10 or 12 days at the most after their recovery, his experience having shown that the curative and preventive properties are retained in the serum only for a rather short time after defervescence.—SURG. C. S. BUTLER.

WINDSOR, J. F. **The Bacteriology of the Human Bile with Especial Reference to the Typhoid-carrier Problem.** Quarterly Jour. of Med., vol. 4, No. 14, January, 1911.

After reviewing the work of previous investigators, the author describes his own investigation of the contents of the gall bladder in 103 cases, outlining his technique and giving details of the more interesting and typical cases. He presents the following summary of his findings:

Briefly summarized, the contents of the gall bladder were examined in 103 cases, with the following results:

In 23 cases the contents were sterile.

In 51 (one-half) *B. coli* was isolated in pure culture.

In 4 *B. coli* was found associated with other organisms, *Staphylococcus pyogenes aureus* twice, *B. pyocyaneus* once, and a diplococcus once.

In 6 *B. proteus* was found; in 8 cases bacilli having no relation to the typhoid-coli group; and in 3 cases *Staphylococcus pyogenes aureus*. The following organisms were each isolated once: *Staphylococcus pyogenes albus*, *Streptococcus pyogenes*, a diplococcus, and an unclassified bacillus. In 4 cases only were members of the typhoid-paratyphoid group found, these being *B. typhosus* twice and *B. paratyphosus* twice.

Gallstones were present in 16 cases, from which was grown in 7 cases *B. coli*, in 1 *Staphylococcus pyogenes aureus*, and in 1 a bacillus not belonging to the typhoid-coli group; in the remaining 7 no organisms were found.

These results show that in a large proportion of cases organisms are present in the contents of the gall bladder, whether examined during life or after death, even when the gall bladder shows no evidence of disease, and in only about 22 or 23 per cent is the bile sterile; on the other hand, the existence of pathological lesions in the bile passages does not of necessity mean infection of the bile, for out of 16 cases in which lesions were found it was sterile in 3, in 1 of which gallstones were present. *B. coli* is the organism most commonly found and was present in exactly one-half of the cases examined. This result

is in accordance with the findings of other investigators, the majority of whom have discovered *B. coli* in bile more often than any other organism; though generally alone, it may be associated with other bacteria, such as *B. pyocyaneus* or the pyogenic cocci, and occasionally it presents very atypical features in its mode of growth. Pyogenic cocci were isolated both from bile and gallstones in about 6 per cent of the cases, and not infrequently bacilli having no relation to the typhoid-coli group, and these are not easy to identify, owing to the fact that certain organisms, such as the pneumococcus and *B. tuberculosis*, can only be grown under special conditions and not on the ordinary nutrient media. *B. proteus*, a putrefactive organism, which has been known to cause acute infection of the urinary tract, was isolated from about 6 per cent. The immediate cause of death appears to have little influence in determining the nature of the organism present in the gall bladder, but, as would be expected, *B. coli* is more frequently found when death is due to intra-abdominal disease than when it is due to affections of other parts. For instance, it was isolated in every case except one in which death was attributed to appendicitis or peritonitis, but was not found when death was due to cardiac disease.—(O. J. M.)

RUSSELL, FREDERICK F., Major, Medical Corps, United States Army. **The Control of Typhoid in the Army by Vaccination.** N. Y. State Jour. of Med., December, 1910.

The first portion of this article compares the typhoid statistics of Europe with those of the United States. "From 1901 to 1905 our death rate for this disease was nearly three times as high as that of England and Wales or Scotland and over twice that of Ireland. It was double that of such a thickly settled country as Belgium and over four times as large as that of the German Empire."

Troops serving in a garrison show only half as much typhoid as the civilian population of military age. However, when sent out for maneuvers, police duty, or mobilization for war the rate at once rises. In 1906, when the troops were sent to Cuba, the admission rate jumped from 5.66 to 57.88 per 1,000 during the first year.

The history of antityphoid vaccination, the technique employed, and the results obtained by the English and Germans are discussed at length. "Among the uninoculated there was one death in every 1.8 cases; among those receiving one dose there was one death in every 8.9 cases; among those who received two doses there was one death in every 21.9 cases, while among those receiving three doses there was one death in every 36.1 cases." The immunity appears to be largely lost after one year, as the statistics then approached those of the uninoculated.

The present method of preparing the vaccine of the United States Army is described in detail.

General reactions following vaccination are absent in over 60 per cent of the cases. The agglutinins increase by the sixth or seventh

day and are quickly followed by the opsonins. The agglutination titre rarely fails to go above 500 and often reaches 5,000 or 10,000. The maximum is reached shortly after the third dose, followed by a rapid and later a more gradual fall. It may reach normal in six months, but usually persists for a year.—(O. J. M.)

Orton, S. T., and Dodd, W. L. Experiments on Transmission of Bacteria by Flies, with Special Relation to an Epidemic of Bacillary Dysentery at the Worcester State Hospital, Massachusetts, 1910. Boston Med. and Surg. Jour. Vol. CLXIII, No. 23, December 10, 1910.

Cultures of *B. prodigiosus* were exposed to flies in the laundry. Flytraps were placed in wards from 300 to 450 feet distant, some located on the opposite side of the building. On the second day flies caught in the kitchen and Lincoln Ward dining room, 100 and 30 feet distant, were found infected. On the third day the traps in the dining room, 425 feet distant, showed infected flies. All the traps contained infected flies within six days.

The authors add: "If the house fly can transmit a culture of *B. prodigiosus* within six days to the screened dining rooms of as many wards, and if 1 ounce of vegetable waste can contain 1,000 maggots, it will certainly prove worth while to take care of the tons of such material which are apt to be found at any such institution which has not undertaken a fly-extermination crusade."

Their conclusions are as follows:

An organism conforming to the Shiga type of *B. dysenteriæ* was recovered from 10 out of 15 cases examined.

B. prodigiosus planted in the laundry was recovered from flies caught in the scullery and five screened ward dining rooms at an interval of from two to six days after the original plant.

It proves impracticable in most insane hospitals to keep the flies from access to fecal matter and from food when they are present outside in large numbers and, therefore, the best prophylaxis against fly-borne epidemics is in cleaning up the breeding places of the fly to reduce its numbers or eradicate it.

The typhoid fly—*Musca domestica*—breeds in tremendous numbers in decaying vegetable waste of varying sorts, and a search for maggot-infested places with subsequent attention thereto offers the best line of attack.

The house fly's egg to adult cycle is 10 days, so that vegetable waste should be cared for at least once a week during fly season.

Horse manure may be treated by chemical means, but it is probable that if it is kept dry and in the dark, but little breeding will take place. Mixing with many times its bulk of cow manure may prove effective.

When possible, all waste material should be plowed into the land without accumulating. Spreading over the land will probaby suffice to reduce the pest markedly.

In hospitals surrounded by considerable ground it is probable that the great majority of the flies are home grown, and the extermination of their breeding places is an object which can not be overlooked.—(O. J. M.)

COAKLEY, C. G., and KENDALL, A. I. **Experiences in the Use of Vaccines in Chronic Suppuration of the Nasal Accessory Sinuses.** Trans. Cong. American Phys. and Surgs., Vol. VIII, 1910.

Chronic cases showing no tendency to immediate cure and in which operative procedure was "inexpedient" were selected. Bacteriological examinations and preparation of vaccines were done by Kendall.

Pure cultures were obtained by twice replating on blood-agar at 37° C., the affected sinus having been first carefully washed with sterile saline solution; identification was accomplished through the use of the "various customary media."

In determining opsonic indices Wright's technique was exactly followed. Control smears were made from scrapings from diseased tissue.

The bacterial results were summarized as follows:

1. The bacterial flora consisted of the following organisms: Streptococcus pyogenes, micrococcus albus, and aureus; staphylococcus pyogenes albus and aureus; bacillus mucosus capsulatus.
2. The opsonic index has been unsuitable either as a means of clinical diagnosis or as a criterion for further treatment.
3. The vaccinations, made up in varying strengths, have not been followed by those changes in the opsonic index which would be expected were this method of treatment one upon which one could rely in practical work.
4. The amount of time necessary to carry out fully a careful opsonic treatment is not only beyond that which the ordinary practitioner could afford to spend, but is, with the present technique and status of the subject, quite out of proportion to the value of the information which one might derive from such procedure.

Therapeutic results were considered valueless, neither benefit nor harm being evident.—SURG. C. N. FISKE.

URD, FRASER B., M. D. **Histological Study of Skin Lesions of Pellagra.** The Jour. of Experiment. Med., vol. 13, No. 1, January 5, 1911.

The author calls attention to the fact that, although the metabolic anges occurring in pellagra and the associated etiological factors ave received careful and extensive investigation, the pathological enomena have been practically neglected. It is for the purpose of edding some light on the obscure pathological changes in the skin at this paper has been written.

Grossly, the lesions of the skin in pellagra resembled those of erythema solare—with the sequence of erythema, bullæ, and finally gmentation. The presence of the lesions in areas exposed to sunht is, of course, well known. Merck says that the skin lesion is a re or less diffuse erythema, subsequently becoming pigmented d scaly, the pigmentation and hyperkeratosis continuing as char-

acteristic of the disease. The tissues frequently are swollen and œdematous with an excess of blood and serum.

Gurd thinks that the lesions are the result of a primary degeneration in the corium, followed by a reparative process. First, there is a degeneration in the collagenous fibers with rarefaction of the papillary layer and a dipping down of the epithelial layer in search of a firmer base. The capillaries dilate as a result of lack of support. New vessels are formed, and an increased vascularity is followed by an increased proliferation of epithelial cells with hyperkeratosis. There is a swelling, fragmentation, and destruction in the elastic element with replacement in the deep zones.

The degenerative changes are followed by an attempt at repair. Round cells, connective tissue cells, and fibroblasts are found in the corium; there is an enormous increase in the pigmentation of the epithelium; a large number of chromatophores are found. The more marked the hyperkeratosis and rarefaction of the corium the greater the pigmentation.

The pathological change is evidence of some external irritant, most probably light. The lesions in pellagra are so similar to those of X-ray dermatitis that the author believes them both to be due to the effect of the ultra-violet ray. It is known that ultra-violet rays are particularly harmful to connective tissue, and, as in the X-ray dermatitis, attack the corium first. The skin has a natural filtration action on the ultra-violet rays of sunlight, but when this action is lost or decreased through altered metabolism, as it may well be by the causative agent of pellagra, the ultra-violet rays seep through the epidermis and attack the corium. Is it not possible that a similar loss of resistance occurs in the other ectodermal structures, i. e., the mucosa of the intestine, mouth, genitals, and nervous system, etc., all these structures being the seat of lesions in pellagra? And since the resistance normal to those tissues against the destructive agents in their immediate environment is lowered or even lost, they must succumb or at least be at a disadvantage until nature can establish a new defense or repair the old.

The author's contention, therefore, is that the first skin changes in pellagra are in the corium; that the ultra-violet ray acts on the corium, which is predisposed to its effects by some agent unknown; that these or similar changes may take place in the intestine, when the same unknown causative agent lowers its resistance and allows the colon and dysentery bacillus to act (diarrhea is a frequent symptom of pellagra); and that what is true for so many ectodermal structures may be true for all. The causative agent in pellagra may lower the resistance of all epithelial structures and make them a ready prey to the foes in their environment.—ASST. SURG. WM. HOWARD HALSEY.

Bayly, H. W. A Résumé of the Evidence Concerning the Diagnostic and Clinical Value of the Wassermann Reaction. Quarterly Jour. of Med., vol. 4, No. 14, January, 1911.

[Extracted quotations.]

Introductory.—The percentage of positive reactions obtained varies considerably with the period of the disease and whether the disease is acute or latent. Thus primary cases in which the lesion has been present for less than a fortnight almost invariably give a negative reaction, while 75 per cent of positive reactions are obtained if the primary sore has been present for over a month. Secondary syphilis with symptoms gives a positive result in over 90 per cent of cases and tertiary syphilis in about 75 per cent. In cases of latent syphilis (viz, syphilis without symptoms) the early cases give a positive reaction in 75 per cent and the late cases 76 per cent in the untreated cases. Different results are obtained with different tissues; thus a very high percentage of positive results is obtained with aneurysm of the aorta, and only a low percentage with cerebral syphilis.

Effect of treatment.—Neisser has observed that the earlier in the course of the disease that treatment is commenced the more probability there is that a negative result will be obtained after a course of treatment. When treatment began as soon as possible after the primary lesion had appeared 75 per cent of negative reactions were subsequently obtained, whereas if treatment had been delayed for six months only 33 per cent of negatives were obtained after treatment.

* * * * * * *

The longer infection has persisted the more stable the positive reaction seems to become and the greater difficulty there is in inducing a negative reaction by treatment; and in some late tertiary and parasyphilitic conditions a negative reaction is never produced even by the most vigorous mercurial treatment.

* * * * * * *

With the Ehrlich-Hata "606" preparation (dioxy-diamido-arseno-benzol) very varying results as regards the Wassermann reaction are recorded in the literature. * * * The history of the use of this new remedy is too recent to enable us to know whether the negative reaction obtained in the majority of cases is permanent. The earlier reports, in which negative reactions were almost invariably recorded as present in a week to a fortnight after injection, seem to have been too optimistic.

* * * * * * *

A solitary negative reaction obtained with the serum of a patient undergoing mercurial or "606" treatment means little but that the patient is reacting to the treatment. A *series* of negative results taken at intervals of three to six months after all treatment has been given up is necessary before the patient can be regarded as cured, and even then until another 20 years have passed we can not be absolutely certain that the disease is completely and permanently obliterated and that no late manifestations will ever occur. It is important to remember that about 10 per cent of untreated cases of syphilis fail to give a positive reaction at the first examination, and that therefore a negative reaction only gives a 90 per cent *probability* of freedom from infection. If, *in recently acquired syphilis*, after several months' treatment the reaction still remains strongly positive and large doses of complement are still fixed it is an indication that the treatment is inefficient and that more rigorous methods should be adopted. If, however, after each course of treatment a smaller amount of complement is fixed or the intervals before a positive reaction returns become longer and longer, we may conclude that the treatment is satisfactory and that there is no necessity to increase the dose.

If we judge the efficacy of treatment by the period of time elapsing between the commencement of the treatment and the onset of the effect of treatment, as shown by the Wassermann reaction, it would appear that "606," mercurial inunctions, intramuscular injections of soluble mercurial compounds, suppositories, and oral treatment must be arranged in the order named. A few cases remain positive after three or more years' treatment, and it is therefore obvious that no fixed time for treatment can be laid down. Three years, however, seems to be the shortest period for mercurial treatment that can be advised with any safety, and this, of course, must be prolonged if the Wassermann reaction is or becomes positive.—(O. J. M.)

SCHELLER, Prof. Dr. R., Demonstrator, Hyg. Inst. Breslau. "**Experimentelle Beiträge zum Studium des Mechanismus der Immunkörper- und Komplementwirkung.**" First contribution. "Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten." Oct. 21, 1910, vol. 56, No. 2.)

In this paper the author gives his results of a series of experiments, to show the effect on hæmolytic action of dilution with salt solution. For his immune body he used the serum from rabbits which had previously been treated with intravenous injections of washed sheep red cells. As complement, he used fresh guinea-pig serum. His washed sheep cells to be hæmolysed were brought up to the original volume of the unwashed, defibrinated blood by the addition of sterile, physiological salt solution, and from this he made a 10 per cent suspension with sterile-salt solution. His physiological-salt solution was a solution of 0.85 per cent water free-sodium chloride.

For the first experiment, the immune body was rabbit serum, titer 1:6,000 and his 10 per cent suspension of sheep cells was sensitized to an equal amount of immune body, 1:1,000. He found that one one hundred and sixtieth cubic centimeter of complement was required for complete hæmolysis, when cells and immune body were used alone; but one-fiftieth cubic centimeter was necessary to accomplish the same result when 7 cubic centimeters of salt solution had been added to the mixture of cells and immune body.

In his second experiment he determines the minimal dose of complement, when the whole volume of the hæmolytic system had been made twice, four times, and eight times the original volume by the addition of salt solution. Here he used dilutions of his immune body of 1:100, 1:1,000, 1:2,000, 1:3,000, and 1:4,000 and he found that in each case there was twice, four times, and eight times, respectively, the original dose of complement required for complete hæmolysis as in the undiluted specimens. From this he concludes that the dose of complement is governed by the concentration and not the amount.

Next he takes up the effect of additions of salt solution to the amount of immune body necessary for hæmolysis, and he found that additions of salt solution had no effect whatever upon the hæmolytic

action of the immune body. He used two immune bodies, one with a titer of 1:6,000 and the other 1:5,000.

For his next experiment he finds the minimal dose of immune body, after the dilution of the whole hæmolytic system and keeping the concentration of the complement the same. He found that the minimal dose of immune body remained unchanged by the dilution with salt solution.

For the last experiments he determines the hæmolytic effect of decreasing amounts of complement on varying (from one-half to 8 cubic centimeters) amounts of immune body and blood cells, but keeping the whole volume the same by the addition of salt solution. In each case the volume was brought up to 9 cubic centimeters with salt solution. His table of results shows that the same dose of complement sufficed for 8 cubic centimeters of blood cells as for one-half cubic centimeter, the concentration being the same.

The author concludes from these experiments that the immune body plays the important part in the chemical action, fermentative, or whatever it is, of hæmolysis, and disagrees with Ehrlich and Sachs, who are of the opinion that the immune body has a modifying rôle in preparing the activity of the real ferment, the complement. The author thinks that the complement plays a part similar to a catalytic agent in the action between immune body and blood cells, from the fact that it acts strictly in accordance with its concentration.

That the complement is not unlimited as to time in its action is due to the fact that it is a very unstable substance and can destroy an action in which it takes no part itself.—ASST. SURG. A. L. JACOBY.

CHEMISTRY AND PHARMACY.

Asst. Surg. E. W. BROWN and Pharmacist O. G. RUGE, United States Navy.

BEEBE, S. P., Ph. D., M. D. **The Preparation of Thyroid Extract for Therapeutic Purposes.** Am. Jour. of Phar., vol. 83, No. 2.

The marked increase in the interest shown in the physiology of the internal secretions and organotherapy—more particularly in the thyroid gland—has led the author to make many interesting, valuable analyses and experiments with reference to this gland. He believes the usefulness of thyroid gland in other conditions than the classical myxœdema has been so thoroughly demonstrated that a standard preparation for therapeutic uses should be available. He states that at present several thyroid products, prepared by different methods and undoubtedly of differing therapeutic effects, are supplied; that therefore they are not uniform in their effects and at times are entirely inactive; that the terminology shows great con-

fusion; that the precise nature of the substance provided is not generally known; and that in some instances supposed thyroid preparations have been found to consist of meat proteids impregnated with potassium iodide, or poor gland substance enriched by adding inorganic iodide.

In the author's opinion the belief that proteids artificially iodized *in vitro* are identical with those formed *in vivo* in the thyroid has no justification, and he believes no artificial product has ever been prepared which has the same effect upon metabolism, myxœdema, and cretinism that is obtained by iodized proteid from the thyroid gland.

The analyses and experiments led to the following conclusions:

(*a*) That no thyroid gland is free from iodine, and that functional activity is proportional to iodine content, other factors being the same; that the published evidence of results showing iodine-free thyroid to have the characteristic metabolic effect of the iodized gland can be explained in that the methods of determining iodine in the analyses of the so-called iodine-free thyroids were faulty and the quantity of this material used for iodine analysis too small.

(*b*) That only portions of the gland are valuable physiologically, and that some of them are actually harmful, experimental evidence being offered in partial substantiation of this statement.

(*c*) That proteids artificially iodized are not identical with and do not have the same therapeutic effect that is obtained by the use of normal iodized thyroid gland.

(*d*) That the iodine content of thyroid glands obtained from healthy animals (pig, sheep, and beef) shows wide variations:

	Milligrams of iodine per gram of fresh gland.
Pig	0.084–2.88
Sheep	.006– .415
Beef	.030–1.470

(*e*) That there is no other substance which acts so economically and efficiently in its effects upon simple goiter, myxœdema, cretinism, and various metabolic disorders associated with hypofunction of the thyroid as the proteid precipitated from extracts of normal human thyroid glands by acetic acid and heat to 44° C., and that therefore only the proteid obtained by a similar method from animal glands should be used.

The author has found the average figures of a large number of iodine analyses of the proteid obtained from normal human thyroid glands (by the process of heating the acidified extract to 44° C. and thoroughly washing the precipitate) to show that 1 gram of the purified proteid contains 3.384 milligrams of iodine. He proposes, then, to standardize the proteid on the basis of its iodine content and establish a uniform dosage regulated thereby—the proteid

obtained from normal human thyroid glands selected as the standard—it being considered, regardless of whether the proteid is richer or poorer in iodine than the standard, that each 3.384 milligrams of iodine will represent 1 gram of the active thyroid proteid. For the purpose of administration the proteid is diluted with lactose and made up into tablets—1, 2, and 5 per cent tablets, these having been found to give a sufficiently wide variation in strength to answer all the usual requirements.—(O. G. R.)

JORDAN, ANSON. **The Action of Urinary Antiseptics.** Bio-Chem. Jour., vol. 5, p. 274, 1910.

The practical experiments were designed to investigate in a thorough manner the action of the more important reputed urinary antiseptics under varying conditions, especially with regard to different organisms and to the reaction of the urine. The following drugs were employed:

(1) Urotropin. This was chosen since it has the reputation of being the most powerful urinary antiseptic we possess.

(2) Sandal-wood oil and its derivatives, santalol-salicylate, were taken as being generally regarded as the most efficacious of the oils, balsams, and resins.

(3) Salicylic acid was selected as the representative of the coal-tar group.

The microorganisms were chosen from groups which commonly affect the urinary tract; those which only rarely occur were not used. There were studied (1) the putrefactive organisms, (2) *Staphylococcus pyogenes*, (3) *B. coli communis*.

The conclusions were as follows:

(1) Using a defined arbitrary standard, the average acidity of normal urine was about 4. With the largest doses of acid sodium phosphate which can be conveniently tolerated, this was raised to 9. The urine is readily made alkaline with potassium citrate.

(2) Putrefaction will occur readily in and the staphylococcus or *B. coli* will grow easily in urines of all degrees of acidity and alkalinity which can be produced in the body. The acidity exercises a restraining influence upon the putrefaction or the growth of staphylococcus which is proportional to its degree; thus, between the limits of alkalinity on the one hand and the highest degree of acidity which can be produced on the other, the time of ammoniacal fermentation is increased about fivefold. *B. coli* was found to grow about equally well in urines of all degrees of acidity and alkalinity within the above limits. It grows as well in alkaline as in acid urine.

(3) Urotropin acts as a urinary antiseptic by the formation of formaldehyde. In an alkaline urine no formaldehyde is formed, and in consequence the antiseptic action is nil. In neutral or faintly acid urines a small amount, probably not exceeding 1 per cent, is split up and the action is feeble. The percentage of formaldehyde, and with it the antiseptic power, increases with the acidity until, with an acidity of 4–5 (i. e., slightly above normal), no organism will grow in the urine. At this point there is reason to believe that about 10 per cent of the urotropin has been converted into formaldehyde. It was found that urotropin acted equally well with the different organisms used.

(4) Sandalwood oil gives an antiseptic power to the urine which is quite feeble against putrefactive organisms or *B. coli*, but shows a marked selective action upon staphylococcus, against which is has quite a specific antiseptic activity.

(5) Salicylic acid increases urinary acidity but slightly. As an antiseptic it has quite a definite action, though not a very powerful one against the putrefactive organisms or *B. coli*, it is much more efficient than sandalwood oil; it has, however, no selective action upon any organism, and is therefore inferior to sandalwood oil for the staphylococcus.—(E. W. B.)

GIEMSA, G. **Wird eingenommenes Chinin mit der Muttermilch ausgeschieden?** (Is ingested quinine secreted in the mother's milk?). Aus dem Institut für Schiffs- und Tropenkrankheiten in Hamburg. Leiter: Medizinalrat Prof. Dr. Nocht.

Giemsa states that this question is answered both in the affirmative and negative in the literature devoted to the subject; that Dr. Schreiber, of the Mission Hospital at Pea Radja, Sumatra, desires this question answered by the institute for practical reasons. The latter's confinement cases having frequently developed latent malaria, he now prescribes quinine for prophylaxis for each mother after birth of the child, which practice has resulted in eliminating the fever frequently complicating these cases. But he believes the effect of the quinine on the child, if secreted in the milk, is to be considered, hence the query.

After establishing special tests for the detection of quinine in milk, four mothers, recently with child, were given quinine and their milk carefully examined, with results that proved negative in each case, not even a trace of the akaloid being demonstrable.—(O. G. R.)

KOLDEWIJN, H. B., Dr. **Uebergang von Arzeneimitteln in die Milch (Elimination of drugs through milk).** Mitteilungen aus dem Pharmazeutisch-toxikologischen Institut der Reichs-Universität Leiden. Archiv de Pharmazie, Bd. 248, Heft 8, 1910, p. 623.

The author observes that from the earliest times the belief has prevailed that many substances ingested by man and animals are secreted in the milk, and this belief has been proved to be a fact by later investigation. He believes that the many conflicting results of these previous investigations and the confusion resulting from failure to differentiate in recording results obtained by testing human milk, and that of the different animals used in the experiments, renders these results untrustworthy. As these tests performed by him were carefully made and recorded and the latest approved methods of research applied, the author believes they may assist in clearing up previous contradictory results.

Cows and goats were used in the experiments and the procedure in each case was practically the same—the animal being given daily doses of increasing amounts of the medicine for from 7 to 30 days, and at the end of this period testing the animal's milk repeatedly, at varying intervals of from 12 to 72 hours.

The experiments were conducted with the following drugs: Mercury, lead, antimony, zinc, bismuth, lithium, alcohol, morphine, quinine, cytisin, aspirin and salicylic acid, urotropin, phenolphthalein, and fluorescein.

His tests proved the following results: In cow's milk, lithium, quinine, and urotropin were positive; mercury, antimony, bismuth, zinc, morphine, and aspirin negative. In goat's milk the results for lead and alcohol were positive; negative for cytisin, phenolphthalein, and fluorescein.—(O. G. R.)

MATTICE, A. F. **The Quantitative Estimation of Albumin in the Urine by Tsuchiya's Process.** Archives Int. Med. 1910, March 15.

An extended comparison is made between the new method of Tsuchiya and the Esbach process. The Tsuchiya reagent consists of a 1 per cent solution of phosphotungstic acid in 96 per cent of alcohol containing 5 per cent of concentrated HCl. It is pointed out that the solution is readily prepared and is stable. The method is recommended as greatly superior to Esbach's in accuracy. The precipitate settles more uniformly and is less dependent on the temperature of the room. It is, therefore, much sharper. Dilutions of the urine are not necessary as in the Esbach procedure; small amounts are as readily determinable as large quantities. There are no difficulties with diabetic urines. A very slight precipitate was regularly obtained with normal urines.—(E. W. B.)

SCHIEMAN, O. **The Quantitative Determination of Albumin According to Tsuchiya.** Zentralb. f. int. Med. Bd. 31, p. 669, 1910.

The method was contrasted with Esbach's plan. Both were tried with 14 urines of varying albumin content, 3 exudates, and 4 transudates. The results were controlled by the absolutely accurate method of quantitave weighing. The following points, emphasized by Tsuchiya, were strictly adhered to: (1) The urine was always filtered and brought to a specific gravity between 1.006 and 1.008; alkaline urines were acidified. (2) The urine was correspondingly diluted if the albumin exceeded 6 per cent. (3) The tubes were carefully inverted ten times. If air bubbles were found inside of the precipitate the tube was rotated in its long axis until such had disappeared. The conclusions are as follows: (1) In urines of large albumin content, i. e., 6 per cent or above, the method of Tsuchiya is more accurate. (2) With amounts of albumin varying from 0.5 to 6 per cent there is no essential difference in the results of the two methods. (3) In urines of very small albumin content both methods are unsatisfactory. The precipitation is clear-cut with Tsuchiya reagent, but results are too inaccurate even for clinical purposes as compared with the weighing process. (4) The Tsuchiya and Esbach methods are both clinically inaccurate as applied to exudates and transudates.—(E. W. B.)

ANDERSEN, A. C. **On the Stability of the Solutions Prepared for Bang's Method of Estimating Sugar in the Urine.** Biochem. Zeitschr., 1910, Bd. 26, S. 157–164.

The titration solutions must be kept in the dark. The white solution containing the hydroxylamine remained absolutely without change for one and one-half years. On the other hand, the blue or copper solution varied from time to time, gradually diminishing in copper content. Still, after three months, the error was slight. It should, however, be standardized against the hydroxylamine solution from time to time. For clinical purposes it need not be so standardized oftener than once in three months.—(E. W. B.)

EYE, EAR, NOSE, AND THROAT.

Surg. E. M. SHIPP, United States Navy.

PRYN, W. W., Fleet Surg., R. N. **Tests for Color Vision.** Br. Med. Jour., August 20, 1910.

The writer states that for many years the Admiralty has aimed at a very high standard of physical fitness in executive officers.

So long ago as February 23, 1857, in order to be successful a candidate had to be free from defect of vision.

In 1868 the requirement was perfect vision in each eye, and in 1879 the regulations provided for the testing of color vision by means of ribbon flags.

In 1887 imperfect perception of colors appeared in the long list of physical disabilities, and in the same year the use of wools was authorized as a test for color perception.

The author states that for 20 years Buxton's marine telechrome has been used for testing color vision at the medical department. This apparatus consists essentially of a lantern containing an Argand burner with regulator for gas supply, the light being permitted to escape only through a small tube. In front of this tube is a metal disk, perforated near its periphery at six equidistant points. The perforations are filled with colored glasses—yellow, blue, pale green, signal green, rose, and red—one of which can be placed in front of the light tube at a time by rotating the disk.

In front of the color disk is a segment of metal with two perforations in it, either of which can be placed before the colors. The larger perforation represents, when seen at a distance of 6 meters, the perspective of a ship's lantern at 100 yards, the smaller the perspective of the same lantern as it would appear at 2,000 yards.

The telechrome is provided with a screen containing a piece of ground glass, which when moved into position covers the test colors and imparts to them the appearance of being seen through a fog.

The most recent directions as to use issued with the instrument are as follows:

The telechrome is to be placed in the dark at a distance of 6 meters from the person whose sight is being tested and on a level with his eyes. The candidate is to sit in good daylight, having in front of him a table with a white cover on which is placed a set of Holmgren's wools.

The operator is to set the small aperture of the metal segment before the test color, and may begin with pale green or rose, passing on to the other colors in turn, and changing the amount of illumination now and then.

The candidate is required to select from the set of Holmgren's wools all the skeins which resemble the test color shown, irrespective of shade (of color).

In testing railway men and sailors it is advisable to use the large aperture after having gone through the test with the smaller one, and to place the fogging glass in situ. One eye at a time should be tested.

As a rule candidates name the colored lights and match them with the wools without the least difficulty, but when lights are misnamed or the wrong skein is selected as a match the wool test is applied and Holmgren's directions closely followed.

According to Holmgren's test, the common forms of imperfect perception of colors are: (1) A feeble chromatic sense; (2) incomplete color blindness; (3) complete red blindness; (4) complete green blindness.

Failure with the lamp is almost invariably followed by failure with the wools, but the sum of his performance is taken into account in estimating the candidate's fitness or unfitness for the service.

The writer further states that between January 1, 1908, and May 21, 1910, 1,389 candidates for commissions in the Royal Navy were examined at the Admiralty, and 1.8 per cent were rejected on account of imperfect perception of colors.

On March 20, 1890, the council of the royal society appointed a committee on color vision, and the report was presented to both Houses of Parliament in June, 1892.

Among the recommendations were the following:

(4) That the test for color vision should be that of Holmgren. If the test be satisfactorily passed, it should be followed by the candidate being required to name without hesitation the colors which are employed as signals or lights and also white light.

(6) That a candidate rejected for any of the specified employments should have a right of appeal to an expert approved by the central authority, whose decision should be final.

(12) That in cases of judicial inquiries as to collisions or accidents witnesses giving evidence as to the nature or position of color signals or lights should be themselves tested for color and form vision.

The author considers the last recommendation as being very important and believes that it might with advantage be extended to all in any way responsible for accident, irrespective of the fact of their being witnesses. He also states that the special examination on appeal is held at South Kensington and consists of two parts: (1) An examination with the wools; and (2) a spectroscopic test in a dark room.

The writer states that the director general, with a view to the adoption of an efficient test for general use in the Navy has had the latest pattern of Dr. Edridge-Green's color perception lantern on trial. The apparatus consists of four disks, three carrying seven colored glasses and one carrying seven modifying glasses, each disk having also a clear aperture.

The other mechanical details are: An electric lamp with projecting accessories, a diaphragm for diminishing the size of the light projected, handles for moving the disk, and the indicator showing the color or modifier in use.

The examination is conducted in a darkened room, the candidate, at a distance of 15 to 20 feet from the lantern, being required to name the color of the light produced by colored glasses alone or in combination either with the modifying glasses or the colored glasses.

The neutral glasses represent fog; the ground glass, mist; and the ribbed glass, rain.

The writer believes that with this lantern, on account of the large number of possible combinations, it is less necessary to require match-

ing with wools, as is required when the Buxton telechrome is used. Still the practice is regarded as useful.

When a person has difficulty in giving the color a name he should be asked to match the color.

In the opinion of the author it is essential that the examiner in this and all other tests should himself have normal color vision, and with a view to the settling of this point it would be advantageous for all who are engaged extensively in testing color vision to be subjected to an examination with the spectroscope.

Some very hard things have been said of Holmgren's test, it having been maintained that it allows some candidates to pass who ought to be rejected and others are rejected who ought to be passed. Used as a check on the lamp test, as has been the custom of the Admiralty, the Holmgren test has been found very useful.

The writer states that the board of trade has recently obtained, through the foreign office, reports upon the color vision tests in use in the principal maritime countries of the world for their merchant service.

It appears that of these Greece and Italy alone have no color test, while the Holmgren wool test, either alone or as an alternative or supplement to other tests, is used in the United Kingdom, Austria, France, Germany, the Netherlands, Norway, Russia, Sweden, and the United States. Japan also employs a wool test, though it is not apparently based on Holmgren's principles.

The author's conclusions are summed up as follows:

1. An examiner should himself have normal color vision.
2. Color vision as required for sea service is best tested by means of a lamp.
3. Of lamps which have been used the Edridge-Green is the best form.
4. The practice of requiring the color lights to be matched with wools is to be recommended.
5. The Holmgren test is useful as an auxiliary.—(E. M. S.)

NANCE, WILLIS O., M. D. **A Note on the Use of Scarlet Red in Corneal Diseases.** Jour. of Ophthalmology and Oto-Laryngology, February, 1911.

The author states that for several months he has been using an ointment of scarlet red of a 10 per cent strength in certain cases of corneal diseases. His experience has been such as to lead him to believe that in this preparation we have a safe therapeutic agent of value.

He believes that scarlet red possesses no antiseptic properties, but that the effect of this drug in corneal diseases appears to be to incite and accelerate regeneration of stroma and encourage cicatrization.

Its field of usefulness, therefore, is in tissue that is more or less "clean." It appears to have little effect in abrasions or superficial epithelial erosions. Its beneficial effects are best demonstrated in

deeper affections of the cornea involving loss of tissue. In every such case treated by the author there appeared to be a rapid regeneration of tissue, definite cell increase, with formation of epithelium.

The cases comprised those of hypopyon ulcer and simple ulcer, after cauterization, descemetocele, corneal fistula, perforating corneal wounds, and one case of extensive loss of corneal tissue by removal of pterygium. In some of the cases the result was little short of marvelous, tissue regeneration occurring in a remarkably short period.

The writer states that favorable reports on the use of the dye in ophthalmology have been published by Walfrum and Verf, Auerbach and Cords.

Davis, in Johns Hopkins Bulletin, 1909, page 176, reports good results with scarlet red in Thiersch grafts. The ointment should be of 4 to 8 per cent strength and should be applied to the edges of whole thickness grafts only, unless the superficial layers are cast off, in which case the whole surface of the graft should be covered, as it will hasten the topping of the graft with epithelium.

To sum up, the writer, as the result of his own experience and of that published by others, is of the opinion that scarlet red is well worthy of trial in the conditions mentioned.—(E. M. S.)

MOSHER, HARRIS PEYTON, M. D. **Report on Progress in Otology.** Boston Med. and Surg. Jour., September 29, 1910.

The writer states that after employing radiography for diagnostic purposes in the mastoid region, Iglaner publishes brief notes of a number of cases thus examined. His conclusions are stated in substance as follows:

The most satisfactory Roentgen pictures can be obtained in profile, the rays centering just below the parietal eminence on one side of the skull and directed through the cranium toward the temporal bone on the opposite side.

The internal anatomy of the ear can be determined thus prior to operation, to the great assistance of the surgeon.

Cases failing to heal after operation should be controlled by skiagraphy, as this may reveal the seat of the trouble.

Under the head of *Stereoscopic mastoid radiograms*, the writer states that the valuable information which the X-ray examination of the mastoid has yielded prompted Lange (Laryngoscope, Vol. XX, No. 4, April, 1910, p. 37) to devise certain improvements in the technic. In the early report of this work it was stated that its usefulness lay chiefly in the examination of the chronic cases, where the bone changes were appreciable. But more recent work has shown that acute cases yield just as satisfactory results.

Indeed, it seems probable that in any acute case in which the inflammation in the mastoid has advanced beyond the possibility of spontaneous recovery—that is, in which the bone has softened and broken down—a properly made skiagram will reveal the bone changes. Conversely, if the skiagram shows little or no bone changes, spontaneous recovery may be considered possible; whereas if appreciable bone change is evident on the X-ray plate, an operation is usually inevitable.

Thus the skiagram may be the deciding factor for or against operation in doubtful cases.

In order to bring out the anatomic and pathologic relations of the mastoid region more clearly, especially the relations of the lateral sinus to the external auditory canal and mastoid cells, stereoscopic skiagrams should be made.—(E. M. S.)

BARDES, ALBERT, M. D. **Ear Disease and Its Prevention.** N. Y. Med. Jour., December 24, 1910.

The writer states that the truth of the proverb that "An ounce of prevention is worth a pound of cure" is nowhere more apparent than in the treatment of acute middle-ear diseases. We have but to remember that 35 per cent of all brain abcesses, 65 per cent of all pyemias, and 10 per cent of all cases of meningitis are known to originate in the middle ear. Besides, it is estimated that over two-thirds of our fellow countrymen have an aural defect of some kind, the most annoying being a discharging ear.

Since nearly every aural trouble begins as an acute middle-ear congestion, the assumption is that if the latter were properly treated in the beginning dangerous sequelæ would be avoided and the disease would not progress to that stage of chronicity wherein cure becomes difficult or impossible.

The functions of the ears are conserved by keeping the nose and throat in a healthy state, and very often the effective prevention of middle-ear disease is accomplished by the removal of a nasal anomaly, such as adenoids in children or a septal or turbinal disorder in adults.

In civilized life an imperfect ear is a decided handicap. Life insurance companies have learned through their losses to rate individuals with faulty ears as poor risks.

The middle ear is not larger than a split pea, yet small as it is it is the most useful and at the same time the most vulnerable space of its size in the body.

Disease germs are constant inhabitants of the nasopharynx, even in health, and in disease they multiply rapidly and menace the ear, especially in children.

The author states that nearly every ear disease is a secondary complaint, the result of a general infectious disease, especially measles and scarlet fever in children and grippe and pneumonia in adults.

The otitis of measles is not particularly dangerous to life, but it is extremely injurious to the hearing on account of its frequent invasion of the labyrinth. Five per cent of deaf-mutism is attributed to it. Most deaf-mutes are not born deaf, but become so early in life.

The otitis of scarlet fever is frequently a dangerous one. Twenty per cent of all discharging ears can be traced to it, and frequently both ears are affected in the same individual.

The otitis due to grippe is perhaps the most troublesome form we have to contend with. Very often it develops suddenly, with marked deafness and sharp pain.

Hearing tests with the tuning forks show diminished conduction both by air and bone—an evidence of implication of the internal ear, a circumstance that adds to the gravity of the disease and frequently interferes with the return of the hearing.

Surf bathing is a common source of ear trouble in summer, both from the impact of the cold water upon the drumhead and from snuffing the water through the nose.

Ordinarily the inflammatory exudate from the middle ear escapes by way of the Eustachian tube. When, however, the mucosa of the tube is unduly swollen the fluid is dammed up behind it and, accumulating, soon fills the tympanic chamber and the mastoid cells. It is the pressure of the imprisoned fluid upon the sensitive drumhead that constitutes earache. An earache should always be given serious attention. If the symptoms are slight and the patient is strong we can attempt to abort the infection by rest, hot applications, fluid diet, a laxative, and possibly a single dose of morphine. More than one dose masks the symptoms. Frequent irrigations with a warm bichloride solution, 1 in 5,000, are usually soothing.

The author states that under no condition should the suffering be allowed to last longer than 24 hours without surgical intervention.

An infected ear should be treated in precisely the same way that a septic formation elsewhere is treated. It is a serious mistake to wait for the drumhead to rupture or for a mastoid abscess to become mature, for in so doing the life of the patient is placed in jeopardy.

In spontaneous perforation much of the drumhead is lost; the opening is ragged, imperfect, and frequently requires to be enlarged for better drainage.

To puncture the drumhead is insufficient. The incision should extend from the distended drumhead into the periosteum of the canal wall.

Occasionally a patient fails to improve after the paracentesis. This is an indication that infectious matter is locked up somewhere, usually in the mastoid cells.

In mastoiditis there is tenderness on pressure over one or more of four points: (1) Over the mastoid antrum; (2) the mastoid tip; (3) the posterior canal wall; and (4) the emissary vein. It is well to compare the tenderness of the diseased ear with that of the sound one.

In the aged, owing to the density of the bone, tenderness is less acute. The only way to ascertain the condition of the middle ear is by using the ear speculum.

Sometimes an inflamed and distended drumhead or a sagging canal wall is hidden from view by a layer of white exfoliated epithelium. This is apt to deceive those not skilled in ear work and cause them to look elsewhere for the trouble.

If the incision of the drumhead fails to cure the infection the open mastoid operation should be performed without delay and before the patient becomes too weak. The advantages of an early operation are that it saves the hearing and checks the progress of the disease.

The severity of a middle ear infection is governed largely by the virulence of the infecting medium and the vital power of the patient. In this connection it is often helpful to ascertain the nature of the infecting organism by microscopical examination.

The disease germs usually encountered are the staphylococcus, the diplococcus of pneumonia, and the streptococcus.

If the staphylococcus predominates we know that the infection is a slight one and that temporizing measures may be employed.

The predominance of one of the other organisms shows a severe infection and one that calls for speedy relief. The daily blood count is frequently of great assistance in these cases.—(E. M. S.)

BURKE, B. B., Capt., R. A. M. C. **The Prevalence of Middle-ear Disease in the [British] Army, with a Suggestion for a Remedy.** Jour. of the R. A. M. C., October, 1910.

The writer states that the extent to which disease of the middle ear prevails in the [British] Army and the loss of efficiency for which it is responsible is hardly flattering to a corps that is maintained "firstly with a view to the prevention of disease." He further states that his experiences amply confirm those of Maj. F. W. Porter who has pointed out the fact that a considerable number of recruits are annually passed into the army already suffering from middle-ear disease.

The author quotes from a report by Lieut. Col. Cottell stating that of the fresh cases of invaliding for all diseases that came before the

Chelsea commissioners during the first three months of 1909, 62 out of 743 were invalids for deafness. Thirty-four of these cases gave a history of having had ear disease before enlistment.

At the Davenport garrison in 1908, consisting of 3,093 persons, there were 47 admissions to the military hospital for ear disease and at the same garrison in 1909, with a strength of 3,285 there were 48 admissions with ear disease, making a total of 95 for the two years. Of this number 11 were invalided from the service.

The author states that, in 1909, 31 out of 34 cases admitted came under his direct observation and were subjected to careful investigation and examination. Of these 31 cases 6 were primary attacks of acute suppurative otitis media. Twenty-five were cases of chronic suppurative otitis media, all of whom gave a history of having had a discharge from the ear prior to enlistment, while in 18 of the latter there was clear and unmistakable evidence that active disease was present at the time of their enlistment.

The writer believes that a considerable amount of middle-ear disease could be prevented from gaining an entry into the military services and is of the opinion that our first line of defense is the recruiting medical officer's examination, but agrees with Maj. Porter that it is quite impracticable on account of the time required and the absence of suitable equipment to make a careful and thorough examination of the ears of every prospective recruit. In the opinion of the writer a fair percentage of cases that are enlisted are seen with a very small perforation situated in the upper part of the membrana tympani, with a scanty discharge from the meatus. We must, therefore, face the fact that unless every recruiting medical officer is a skilled aurist, having the time and necessary instruments at his disposal, these cases, so common among the class from which our recruits are drawn, must frequently get through the first line of defense. For example, Cheatle, in examining 1,000 school children, found that 335 of these had a discharge from one or both ears. Recognizing this fact, we must fall back on our second line of defense and adopt means to prevent any man suffering from middle-ear disease completing three months' service. This will entail the examination of the ears of every recruit by a skilled aurist at some period or other during his first 10 weeks of service, and the fact noted in his medical record.

In order to carry out this plan the author believes that medical officers should be encouraged to take up the study of ear diseases and become skilled aurists.

Capt. Burke has directed our attention to a very important and interesting subject that merits careful consideration. The Annual Report of the Surgeon General of the United States Navy for 1910

shows that 53 men, after less than four months' service, were recommended for discharge in 1909 on account of deafness and ear disease existing prior to enlistment.

In the same report, under the head of "Discharges from the Navy and Marine Corps for physical disability during 1909," there were 110 men discharged for deafness and ear disease, which takes third place in order of importance among the diseases causing disability and discharge from the service.—(E. M. S.)

WARFIELD, MACTIER, M. D. **Peritonsillar Abscess.** Johns Hopkins Hosp. Bull., February 11, 1911.

The author states that this abscess is always painful and at times dangerous. He defines a peritonsillar abscess as one that results from infection of the loose connective tissue immediately about the tonsil and presents the symptoms with which we are familiar as belonging to quinsy. Since it is supposed that the starting point of the infection may be anywhere in the peritonsillar connective tissue, the resulting abscess has no definite position where we may always look to find it. The writer further states that the procedure for opening an abscess usually given in the textbooks is this: When an incision is decided upon, it is not attempted, as a rule, to definitely locate the abscess, but the incision is made at a site which experience has shown to be the usual point of greatest swelling and where pus can be found. This incision is begun at a point opposite the junction of the uvula with the soft palate and about three-eighths of an inch external to the inner border of the anterior pillar of the fauces, and is carried from above downward about one-third the distance from the point of origin to the lower border of the tonsil. The knife is plunged into the swelling to the depth of half an inch.

Often where there have been unmistakable evidences of the presence of pus, and when the incision has been carefully made, the abscess is not opened. This incision is not without danger. In making it the ascending pharyngeal artery has been cut and the carotid also. To permit the abscess to open spontaneously has its dangers also. Abscesses have burst during sleep, and the pus, entering the air passages, has drowned the patient. Pus has burrowed down and found a way out in the axilla or, entering the pleural cavity, has caused death. Most abscesses when let alone open up themselves between the fifth and tenth day, but at times this does not happen for five or six weeks. The writer states that from long experience he is of the opinion that the infection always starts from the same point and that point is in the supratonsillar fossa, and that the abscess is always the result of the extension of the infection to a cavity which opens

into this fossa. This cavity or space is in the connective tissue and extends outward along the superior border of the tonsil and downward along its outer border, thus bounding it on two sides. The abscess begins at the supratonsillar fossa, and as pus continues to form, it occupies first that part of the cavity which is above the tonsil and then the part on its outer border.

As the part on the outer border of the tonsil becomes distended with pus, it forces the tonsil out of its usual position, and pushes it inward toward the uvula, making it appear as if it were swollen, but its increase in size is only apparent and not real, for the abscess is never within the tonsil, but external to it. The author gives as the chief causes of peritonsillar abscesses acute follicular tonsillitis, imperfectly removed tonsils, and rheumatism.

After an attack of acute tonsillitis the pain and fever usually disappear at the end of three or four days, and the patient thinks he is getting well, but it is often only the lull before the storm. Whatever the cause of the abscess may be, and whether it is large or small, it can always be located in the supratonsillar fossa, which itself can easily be found, even when the throat is very much swollen and distorted. This, then, is the place where the abscess is to be opened in every case.

The necessary incision is made, according to the author, with a curved bistoury, which is held parallel to the soft palate with the edge of the blade looking forward, the back toward the posterior pillar, and the point directed outward toward the ear. The point is entered in the supratonsillar fossa, in the angle between the pillars of the fauces as high up as possible, and is passed outward until it meets an elastic resistance, which is the abscess. This is entered and the knife is brought out straight forward through the anterior pillar. As a rule, the knife does not have to enter more than a half inch to reach the abscess. The cut in the anterior pillar is through swollen mucous membrane and does no harm.

A bent probe can then be passed through the opening made in the abscess over the tonsil and to its outer side, thus demonstrating the existence of a cavity there. As the ascending pharyngeal artery and the carotid are at the back of the knife they are in no danger of being cut. An incision at this point has three advantages—it is perfectly safe, it is easily made, and it is always successful.—(E. M. S.)

REPORTS AND LETTERS.

THE SURGICAL ASPECT OF THE ENGAGEMENT AT LA CEIBA, HONDURAS.

By Passed Asst. Surg. L. W. Bishop and Asst. Surg. W. L. Irvine, United States Navy.

These notes are presented with the hope that they may prove instructive in representing on a small scale what we may be called upon to encounter at any time on a scale of greater magnitude. Contrasted with the usual Central American revolution, the attack and defense of La Ceiba were conducted on scientific principles. The forces were armed with modern high-power weapons. The casualties were proportionately as high as in many modern battles, and the character of the wounds was typical of what would be expected of modern projectiles.

The attacking column consisted of 450 men, and the Government force of 400 men was intrenched behind well-constructed earthworks. The casualties numbered 102, of which 68 were wounded, showing a casualty list of 12 per cent of the total number engaged. It is to be noted that the attacking force suffered 80 per cent of the casualties.

In anticipation of an engagement, all arrangements were made for the rendering of international relief to the wounded. A vacant building was selected for a hospital and ambulance parties organized and instructed in their duties. The attack lasted from 9 a. m. to 12 m. of January 25, 1911. Immediately on the cessation of hostilities an ambulance party of 25 men was landed from the *Tacoma* and *Marietta*. One-half of the party was organized into stretcher squads and dispatched to the firing line, with instructions to apply first-aid dressings and bring in the wounded, while the remainder, with their hospital equipment, proceeded to organize an emergency hospital. As cases were brought in they were classified, tagged, and dressed. An operating department and two wards were established, and by evening of that day a 50-bed hospital was well under way and everything arranged for necessary operative work on the following day.

Some 53 of the severest cases were received by us, the remaining cases of a minor character being treated by natives. The varied char-

acter of the wounds received may be judged from the following list:

Perforating wounds:	
Skull	3
Skull, chest, and abdomen	1
Thigh, with fracture	3
Leg, with fracture	1
Knee	1
Upper extremity, with fracture	5
Chest	3
Soft parts of severe character	12
Penetrating wound of skull, with fracture of outer table	1
Penetrating and perforating wounds of lesser magnitude	23

The action was commenced at a range of 800 yards, and the majority of wounds were received at between 500 and 200 yards and made by the hard-jacketed bullet of the .30-caliber machine gun and high-power Remington. Wounds of the long bones were characterized by a very small wound of entrance and a slightly larger wound of exit, invariably being accompanied by extensively comminuted fracture. In not a single instance was a case found without fracture.

The explosive character of the modern bullet at close range was vividly demonstrated in the case of the wounds of the skull. Here the wound of entrance would approximate a 10-cent piece in size and that of exit the size of a dollar, the latter being accompanied by most extensive comminution of the adjacent bone. These wounds were regarded as mortal, and all proved so despite operative interference. The vitality shown by these cases was remarkable, all of them surviving from one to three days. One case was noteworthy in this respect. This man was struck by a .30-caliber bullet just below the right parietal eminence; the bullet traversed both lobes of the brain, and emerged 2 inches to the left of the saggital suture on the opposite side. There was a wound of exit 2 inches in diameter, accompanied by radiating fracture and protrusion of the brain substance. This case survived some 36 hours, although so gravely wounded.

Wounds of the soft parts were without special interest. In the chest wounds the searing properties of the bullet of high velocity were noticeable by the very slight hemorrhage encountered. The occasional wound caused by the large soft bullet of .56 caliber was readily recognized by the large gaping wound made by it and was accompanied by great laceration of tissue.

Contrary to what would be expected of cases which were removed almost immediately on the cessation of firing and received early dressing, there was considerable infection. This is readily accounted for by the filthy clothing and lack of personal cleanliness so characteristic of the natives of the lower classes of this section. It furnishes

a good example of the necessity for a clean skin and clean clothing on the part of combatants before an engagement.

Owing to the enforced sailing of the ships the work ashore was necessarily confined to one of organization and the necessary treatment of the first few days, the hospital being turned over to native surgeons on our departure.

We desire to express our appreciation of the cooperation and assistance rendered by Staff Surg. Clark, R. N., of H. M. S. *Brilliant.*

EXTRACT FROM SANITARY REPORT OF U. S. S. "NEW ORLEANS" FOR THE YEAR 1901.

The annual sanitary report from the U. S. S. *New Orleans* for the year 1901, forwarded to the bureau by Surg. W. F. Arnold, United States Navy, retired, at that time the medical officer of the *New Orleans*, is of peculiar interest to the members of the Medical Corps of the Navy who are testing the efficiency of venereal prophylaxis in the service to-day.

The report warrants the inference that ten years ago Surg. Arnold considered compulsory prophylactic treatment to be the most effective method of preventing venereal diseases. This opinion is concurred in by a large number of naval medical officers who are employing prophylactic treatment of the persons who have been exposed to venereal infection.

The report in part is as follows:

It is striking to note the disability from the sequelæ of gonorrhea and of chancroidal ulcers, 75 per cent of which is ascribed to concealed and self-treated cases. About 12½ per cent of loss of service for the year has been thus incurred. Two men have had successive attacks of orchitis following reinfection in each case, and their sick days exceed those from the sequelæ of all declared gonorrhea observed on board.

No punishments have been inflicted in any of the cases referred to.

With better facilities for attending to these cases and with certain essential guaranties (such as that of reasonable purity of oil of sandalwood), it is hardly to be doubted that great loss of service may be avoided here. As heretofore, I consider Hutchinson's treatment satisfactory.

I think it important to note that the German Navy surgeons claim gratifying results from prophylactic silver nitrate solution instilled into the urethra as soon as possible (and up to 24 hours) after intercourse—all such being regarded as suspicious *ex vinculo matrimonii*. The plan authorized by the Imperial German Navy's surgeon general, so I have been informed, is to punish (with confinements and other severities as demanded of from 3 to 14 days) anyone that develops gonorrhea without having resorted to this prophylactic. It is applied by the hospital stewards as soon as possible after the man's return from liberty. In other words, the use of the prophylactic is the price of immunity from punishment after gonorrheal infection. It is said to have been in use in the German Navy for about a year, and it is extremely well thought

of by their superior line officers as well as by all of their surgeons. I consider the question as of the greatest importance, which, indeed, is so obvious as to need no emphasis. A priori objections to its practice are not, so I consider, weighty, at least from the professional side of the question. The inconvenience is said to be slight—often entirely absent; and, so far as our Navy is concerned, it is doubtful if the demonstration of its entire effectiveness would materially increase sexual incontinence. On the other hand, the Medical Corps is in the indefensible position of doing practically nothing to prevent its most prevalent infectious disease—the one, moreover, whose source is of all, perhaps, the best delimited. (See Annual Report of the Surgeon General, United States Navy, 1901. Scale diagrams, p. 127. From the tables preceding it will be seen that the loss of service due to it and its sequelæ is about 200 per cent greater than that of grip.)

Testimony as to the ineffectiveness of attempts to control gonorrhea through the regulation of prostitution is too abundant to use here, as entirely conclusive as much of it is. It will suffice to say that gonorrhea is as common in Japan as almost anywhere else where no more systematic "regulation" of prostitution could be had—a fact that the comparative rarity of syphilis shows. I shall only call attention to the significant facts that this prophylaxis is of German origin, and that it was considered highly desirable to employ it at Tsingtau, the principal town in the new German colony at Kiaochau. Its plan of government is entirely autocratic; hence the conclusion is inevitable either that clandestine prostitution is not regulable or that gonorrhea in women can not be absolutely excluded in any given case.

The technique is simple: Two per cent silver nitrate solution in water is instilled in the fossa navicularis with a pipette and retained there from three-fourths of a minute to a minute.

The prophylaxis for chancroid is disinfection with mercuric chloride solution. This is not unusually successful, so I inferred.

In the absence of any effort at regulating the public women in almost all of the cities in China, and in view of their large wartime increase of inhabitants, the conditions of sexual matters could not well be worse. This has borne with great severity upon our naval apprentices and has inspired what I have said above about noting syphilis on enlistment records. It is questionable whether the service should not assume the risks and treat syphilis more assiduously in desirable men rather than use it as a cause for rejection for reenlistment.

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NO. 3 VOL. 5

UNITED STATES NAVAL MEDICAL BULLETIN

FOR THE

INFORMATION OF THE MEDICAL DEPARTMENT OF THE SERVICE

LIMITED TO PROFESSIONAL MATTERS AS OBSERVED BY MEDICAL OFFICERS AT STATIONS AND ON BOARD SHIPS IN EVERY PART OF THE WORLD, AND PERTAINING TO THE PHYSICAL WELFARE OF THE NAVAL PERSONNEL

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TRUMAN H. NEWBERRY,
Acting Secretary.

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PREFACE.

The publication and issue of a quarterly bulletin by the Bureau of Medicine and Surgery contemplates the timely distribution of such information as is deemed of value to the medical officers and the hospital corps in the performance of their duties, and with the ultimate object that both shall continue to advance in proficiency in respect to all of their responsibilities.

It is proposed that the Naval Medical Bulletin shall embody matters relating to hygiene, tropical and preventive medicine, pathology, laboratory suggestions, chemistry and pharmacy, advanced therapeutics, surgery, medical department organization for battle, and all other matters of more or less professional interest and importance under the conditions peculiar to the service and pertaining to the physical welfare of the naval personnel.

It is believed that the corps as a whole should profit, to the good of the service, out of the experience and observations of the individual. There are many excellent special reports and notes beyond the scope of my annual report being sent in from stations and ships, and by communicating the information they contain (either in their entirety or in part, as extracts) throughout the service, not only will they be employed to some purposes as merited, but all medical officers will thus be brought into closer professional intercourse and be offered a means to keep abreast of the times.

Special attention will be given by the instructors of the Naval Medical School to the review of advances in medical science of special professional interest to the service, as published in foreign and home journals, and extracts from these will appear in the bulletin, together with such remarks as the instructors may deem of value to officers on foreign service or sea duty.

Information received from all sources will be used, and the bureau extends an invitation to medical officers to prepare and forward, with a view to publication, matter on subjects relating to the profession in any of its allied branches.

C. F. Stokes,
Surgeon General, United States Navy.

SPECIAL ARTICLES.

TROPICAL DISEASES IN THEIR RELATION TO THE EYE.

By Surg. E. M. Shipp, United States Navy.

We are told that the foundation of modern tropical medicine may be said to have been laid when it was realized that animal parasites cause disease. This discovery dates from about 1547, when trematodes were first recognized by Jehan de Brie in the form of the liver fluke in sheep, which fluke was afterwards described by Gabucinus.

The knowledge of parasitic worms has been greatly increased by the works of Dubini and many others; more recently by Looss, of Cairo; Low and Stiles, of the United States of America; Sambon and Leiper, of the London School of Tropical Medicine; Ashburn, Craig, Musgrave, and other workers in the Philippine Islands; but among all these names connected with tropical helminthology that of Sir Patrick Manson stands first because of the far-reaching importance of his researches into filariasis. The evolution of the microscope and the discovery of bacteriology in more recent times have been great factors in the development of knowledge of tropical diseases. It is believed, however, that the protozoa parasitic in human beings offer to-day the widest field for scientific research, and promise more than any other subject in tropical medicine. Among the parasitic protozoa in human beings, one of the first to be discovered was *Balantidium coli* found by Malmsteu in 1856. Later the discovery of the *Entamœba histolytica*, which causes a certain kind of dysentery, was followed by the discovery of the parasite of malarial fever.

In 1901 Ford and Dutton discovered a trypanosome called by Dutton "*Trypanosoma gambiense*," which has since been found to be the cause of sleeping sickness.

Trypanosomes were found in the lower animals long before they were discovered in man. Under the head of Protozoa are given Treponema, among the most important of which is the *Treponema pallidum*, causing syphilis, and described in 1905 by Schaudinn. It will be seen from the foregoing very brief account of the evolution of tropical medicine that we are merely standing upon the threshold of what is to be known, and that the subject offers a wide field for investigation and research, not only from the standpoint of general medicine, but also from the standpoint of the relation of tropical affections to the eye.

The writer believes that this subject is of special interest to the medical officers of the Army and Navy because of the fact that we are called upon to treat a large number of persons who live in the tropical possessions of the United States. For example, there are 50,000 employees of the Government engaged in building the Panama Canal, all of whom are cared for in case of illness chiefly by the medical officers of the Army and Navy; while in the Pacific Ocean we are brought into close contact with the 10,000,000 people who inhabit the Hawaiian Islands, Guam, Samoa, and the Philippines. All of these people live strictly within the Tropical Zone, and many of them suffer from the diseases that are peculiar to the Tropics, therefore we are particularly fortunate in having splendid opportunities for the observation and study of tropical diseases in their relation to the eye. In Panama we have malaria; in Hawaii, leprosy; in Samoa, filariasis and yaws; in Guam, gangosa, leprosy, and yaws, while the Philippines offer a large field for research and investigation. When the Panama Canal is completed the United States, and especially the east coast, will be brought more closely in contact with the Far East and tropical countries than ever before, and it would seem that the time will soon be ripe for the opening of a large school of tropical medicine, possibly in New York, where clinical material may be gathered from the ships that come from tropical countries. There are, of course, many diseases that are common to both temperate and tropical climates, but which occur possibly with greater severity in the Tropics; then there are diseases that have not been found in the tropical possessions of the United States, but which may be brought to this country when the canal is opened.

It is not the intention of the writer to enter into a detailed description of any of the tropical diseases, but to confine his efforts entirely to a discussion of the etiology of these diseases, and of the eye symptoms and lesions that are peculiar to each.

So far as possible the affections discussed in this paper have been classified etiologically under five heads, viz:

1. Those due to bacteria:
    - Leprosy.
    - Plague.
    - Acute conjunctivitis. (Koch-Weeks.)
    - Chronic conjunctivitis. (Morax-Axenfeld.)
    - Cholera.
    - Glanders.
    - Superficial punctate keratitis of Bombay.
    - Rhinoscleroma.
2. Those due to molds:
    - Aspergillosis.
    - Favus.
    - Tinea trichophytina.
    - Sporotrichosis.

3. Those due to protozoa:
   - Malaria.
   - Relapsing fever.
   - Oriental sore of lids.
   - Yaws.
   - Syphilis.
   - Trypanosomiasis.
4. Those due to helminths:
   - Tænia solium.
   - Tænia echinococcus.
   - Filaria loa.
5. Those due to toxins and other causes:
   - Lacquer poisoning.
   - Loliismus.
   - Vanillismus.
   - Quinine amblyopia and amaurosis.
   - Methyl-alcohol blindness.
   - Amblyopia in general.
   - Beriberi.
   - Keratomalacia.
   - Endemic paralytic vertigo.
   - Japanese river fever.
   - Smallpox.
   - Congenital leucoderma.
   - Goundou.
   - Oscinidæ.
   - Trachoma.
   - Gangosa.
   - Myiasis.

DISEASES DUE TO BACTERIA.

Leprosy is found in the following tropical possessions of the United States: The Hawaiian Islands, Guam, and the Philippines, and has existed in various parts of the world for many centuries.

The eye lesions found in leprosy may be localized in the lids, or any of the tissues of the globe may become involved.

According to Axenfeld the same characteristic disposition of the lepra bacillus is found in the lids and in the tissues of the eye as is met in other parts of the body. Scheube states that nodular infiltrations very frequently form in the eyelids and may in rare cases ulcerate, and after cicatrization lead to ectropion, entropion, and trichiasis. Nodules may form in the conjunctiva and subsequently ulcerate, or the conjunctival affection may take the form of a diffuse catarrh, with numerous papillæ, very rich in cells.

According to Axenfeld a direct spread of the diseased process from the neighboring parts to the globe is rare. Infection is much more common from the blood or lymph stream, and in this the peculiar arrangement of the vessels at the corneo-scleral margin and its neighborhood takes an important part. As the cornea is nonvascular, it can not be attacked primarily; but accordingly as the bacilli pass in

from the deep or superficial vessels, a form of pannus or an interstitial change will occur. Primary nodules often occur at the limbus. The nodules which are found in the anterior chamber are derived from the uvea through the angle of the chamber. Axenfeld further states that the frequency of an affection of the uvea is of great importance in many cases of leprosy. The most common starting point is the root of the iris, in the angle of the anterior chamber. Generally the leprous changes in the chorioid can not be seen with the ophthalmoscope, as they are usually in the anterior part. According to the same author changes in the retina are uncommon and not obvious. The lens is often secondarily cataractous.

Lie found the lepra bacillus in the optic nerve only once in the absence of other changes.

Continuing, Axenfeld states that, in comparison with the characteristic and readily determined features of the tubercular form, the maculoanæsthetic form very poorly repays examination, being only available for research in the later stage, when the bacilli are no longer to be found in the nerves and the spots.

This subject is a particularly interesting one because of the fact that leprosy even now presents problems such as are encountered in few, if any other, diseases. However, in the light of recent contributions toward its study many of these problems appear to be in a fair way toward solution. It is almost two years since Clegg first announced the successful prolonged cultivation of the organism of leprosy on artificial media, and since then Duval has devised methods that make this proceeding one of comparative simplicity.

Success in animal inoculation has advanced almost equally with the progress in artificial cultivation of the organism.

By successive injections of a pure culture of the leprosy bacillus Duval has succeeded recently in producing in the monkey a type of disease very similar to the human form, and in recovering the acid-fast organism from the remote lesions. Of considerable interest as bearing on the method of transmission is the fact that Duval and Gurd were able to cultivate the organism from nasal secretions in two of five cases. They also succeeded in inoculating mice by rubbing cultures of the bacillus into their nares after gentle scarification.

The same investigators have taken up the serum reactions of leprosy. It will be seen that, as a result of the foregoing work, Koch's postulates have now been fully carried out for leprosy, and with the means at our disposal further progress should be rapid.

Profiting by our many disappointments with the serum treatment of tuberculosis, it will be well to guard ourselves against expecting too much in the way of effective therapy of the disease as a result of recent experimental work.

Plague.—Eye complications are not infrequent in this disease. Maynard [1] observed the following complications in an epidemic at Patua: Cornea, infiltration, 6 cases; sloughing, 4; iritis, 12; scleral staphyloma, 2; lens, incipient cataract, 7; mature cataract, 5; retinal hemorrhage, 1 case. According to Calvert conjunctivitis is common.

Acute conjunctivitis due to the Koch-Weeks bacillus is very widespread over the earth. In the tropical world it is found in Egypt, Ceylon, Cuba, Java, and the Philippines.

Chronic conjunctivitis, due to the diplobacillus of Morax-Axenfeld, is perhaps the most common of conjunctival affections and one of great importance, especially for the cornea. It is found throughout the tropical world.

Cholera.—According to Weeks the following eye symptoms occur in cholera. The cornea is prone to suffer from desiccation. Cyanosis of the lids and of the fundus oculi occurs to some degree in many cases. Subconjunctival hemorrhage occurs in the severe cases. The condition of the pupil during the algid stage decides the prognosis.[2] If the irides react to light, the prognosis is favorable; if not, the prognosis is unfavorable.

Glanders.—According to Axenfeld this disease has several times been observed on the lids. Knapp [3] found the *Bacillus mallei* in an ulcer of the lower lid. In Neisser's case [4] an inflammatory swelling developed, extending from the inner canthus, and later led to a dacryocystitis.

Superficial punctate keratitis of Bombay.—This is a name given by Maj. H. Herbert to a form of keratitis very prevalent in Bombay in warm weather at the close of the rainy season. An encapsulated bacillus, as yet uncultivated on artificial food media, is found in the epithelium of the cornea and is supposed to be the cause of the keratitis.

Rhinoscleroma.—According to Axenfeld this disease may affect the tear ducts, the lacrymal sac, and the adjacent parts of the skin. Bacteriological examinations with positive results are recorded by Gallenga. His findings were typical. Capsulated bacilli were found strongly resembling the pneumobacillus in morphology and biology, and, according to de Simon, certainly belonging to that group.

DISEASES DUE TO MOLDS.

Aspergillosis of the eye.—Aspergillus fumigatus has been found several times in ulcers of the cornea.

Favus.—According to De Schweinitz this disease, in the form of dirty, yellowish-white crusts, occasionally appears upon the eyelids

[1] British Med. Jour., Sept. 14, 1901.
[2] Corte, Deutsch. Med. Woch., February, 1907.
[3] Arch. of Oph. XXVII, p. 374.
[4] Berl. Klin. Woch. 1892 s. 321.

and may be mistaken for blepharitis. Microscopic examination of the crusts would reveal the mycelium and the conidia.

Tinea trichophytina.—Ringworm of the lids, while occurring with greater frequency possibly in the Tropics, presents no special peculiarities.

Sporotrichosis.—As shown by Morax and Carlotti, and later by other writers, the eyelids and conjunctiva are sometimes infected with Sporotrichum, the variety most frequently found being the *Sporotrichum beurmanni.* According to De Beurmann, infection takes place by contact with unclean vegetables, as these fungi live apparently as saprophytic on lettuce leaves and other vegetables used as salads, and also on insects (flys, caterpillars, larvæ).

DISEASES DUE TO PROTOZOA.

Malaria.—This disease is found throughout the tropical world and in many places in its most pernicious form. The eye lesions found in this disease are given as follows: Amblyopia, keratitis profunda, keratitis dendritica, herpes febrilis corneæ, optic neuritis, retinal hemorrhages, opacities of the vitreous, and heterophoria.

Manson stated that in rare instances a comatose pernicious attack eventuates in blindness. The amblyopia is usually transient, lasting for an hour or two only. On the other hand it may be persistent; in which case, according to Poncet, optic neuritis, peripapillary œdema, extravasation of leucocytes, plugging of retinal and choroidal vessels by parasites and consequent multiple hemorrhages may be found in the fundus.

Keratitis dendritica, according to Scheube, begins in the course of or after an attack of malarial fever with photophobia, supraorbital neuralgia, and a narrow superficial serpiginous ulcer resembling a skeleton leaf with lateral processes forms on the cornea.

Keratitis profunda sometimes comes under observation in malarial cachexia; a grayish infiltration in the middle or deeper layers of the cornea may form. Yarr describes the following additional disorders: Sudden but persistent amaurosis without ophthalmoscopic changes (central lesion), periodical amaurosis (œdema, hemorrhages), amaurosis beginning suddenly and ending in atrophy of the optic nerve (perhaps hemorrhage into the optic disks), persistent central scotoma (macular hemorrhages), periodical blue vision. Van der Burg and Martin advise that in every corneal affection in the Tropics accompanied by fever quinine should be given.

The relapsing fevers.—The term "relapsing fever," according to Castellani and Chalmers, includes several diseases caused by different spirochætes. They recognize at present the relapsing fever of Europe, America, India, and Africa, and are not certain that other

types may not be differentiated. The eye lesions found in this disease are conjunctival hemorrhage, iritis, and corneal ulcers.

Oriental sore of the lids.—Axenfeld states that in the collected literature given by Groenouw[1] two cases of oriental sore recorded by Willemin, 1854, are given. According to the later researches of Brocqu and Veillon this disease is perhaps a Streptothrix infection. Recently many observers have referred this affection to protozoa of the genus Leishmania.

Frambœsia tropica (yaws).—According to Castellani and Chalmers this is a tropical specific infectious disease caused by a Treponema, and characterized by a peculiar granulomatous eruption. Yaws is essentially a tropical disease, and is found in Africa, Asia, the West Indies, and many islands of the Pacific Ocean; Samoa, Fiji, Guam, etc. The course of the disease may be divided into three periods: A primary stage, comprising the development of the primary lesion; a secondary stage, during which the characteristic granulomatous eruption of frambœsia appears; a tertiary stage, in which the late manifestations of the disease develop; deep ulcerations and nodules simulating gummata.

The eye lesions of yaws are given by Castellani and Chalmers as follows:

> Granulomatous and papular eruptions may develop on the eyelids. A slight periostitis of the orbital margin is not rare, the margin becoming thickened and very painful on pressure. The occurrence of iritis is denied by most authors. In the Colombo Clinic two typical cases were observed during the general granulomatous eruption.

It is interesting to note in connection with this disease, which so closely resembles syphilis, both in its etiology and pathology, that there are no eye symptoms or lesions of any importance, while in syphilis the eye complications are numerous and serious.

Syphilis.—This disease is found generally throughout the tropical world, and is mentioned in this paper because of the recent important discoveries in regard to its etiology and treatment. The eye affections occurring in this disease are so numerous and have been so thoroughly discussed in all the textbooks on the eye that no further reference will be made to them.

African trypanosomiasis.—Castellani and Chalmers state that trypanosomiasis is an acute or chronic specific infection, caused by *Trypanosoma gambiense duttoni* and disseminated by *Glossina palpalis* Robineau-Desvoidy, and characterized by an inflammatory condition of the lymphatic system leading to meningo-encephalitis and a meningomyelitis. The distribution of the disease at the present time may be said to extend along the west coast of Africa from

[1] Handb. der Aug. von Saemisch, 2d edition. 1903.

Senegal to Angola; through the whole of the Kongo into Uganda and Rhodesia; southwards to German East Africa, etc. The discovery of the tsetse fly in Arabia makes it possible that the disease may still further extend its area. The eye complications found in this disease consist of iritis and interstitial keratitis. The disease is still the subject of experimental study, at least so far as the eye is concerned, and it is possible that many interesting and important discoveries may be made in the near future.

DISEASES DUE TO HELMINTHS.

Tænia solium.—According to Daniels and Alcock this variety of tapeworm is not widely distributed in the Tropics, especially in Mohammedan countries. In non-Mohammedan tropical countries, such as China and South Africa, where pigs are freely eaten, this tape worm is common. The *Cysticercus cellulosae*, which is the scolex of the *Tænia solium*, may enter the eye by the blood stream, and may be found as a cysticercus vesicle of the anterior chamber, or in the form of a parasitic cyst of the iris.

According to Fuchs the cysticercus most often gets into the vessels of the chorioid and when it leaves there passes at once beneath the retina, detaching it from the chorioid. When it has reached a certain size it perforates the retina and gets into the vitreous. In the vitreous the cysticercus becomes visible as a bluish white bladder. If the head and neck are drawn in they appear in the form of a brilliant white spot; but if they are protruded they can be recognized quite distinctly, and it is even possible to make out in the head the suctorial disks and the crown of hooklets. The animal often makes very active spontaneous movements. Opacities, however, very soon form in the vitreous, in the shape of membranes which so envelop the animal that nothing can be seen through them but a dense white mass. Ultimately the eye undergoes destruction from iridocyclitis. According to O. Schirmer, there is no sound evidence that intraocular cysticercus, without associated iridocyclitis, or spontaneous inflammation of one eye can cause sympathetic ophthalmitis, although sympathetic irritation may, no doubt, arise in consequence of any of these conditions.

A cysticercus may also form a cyst of the orbit, in which case it would have to be differentiated from the other cysts and tumors commonly found in this region.

Tænia echinococcus.—This parasite is known in the Philippine Islands and is not uncommon in Egypt and Algeria. According to Fuchs the cysticercus of this parasite is occasionally found in the vitreous of the eye. It may also form a cyst of the orbit.

Filaria loa.—Manson states that Filaria loa has been known for over 300 years and that it appears to be widely distributed through-

out tropical West Africa from Sierra Leone to Benguela. Cases are occasionally seen in Europe and America, in both negroes and whites, but only in persons who have frequented those parts of Africa inhabited by the parasite.

Scheube states that *Filaria loa* is observed in various parts of the body, but more particularly in the eyelids, beneath the conjunctiva and in the anterior chamber of the eye; in fact it seems as if the worm has a decided predilection for the eye and its neighborhood. It causes itching or stinging and a sensation of creeping, with a circumscribed redness and swelling on the places affected. When, however, it lodges in the subconjunctival cellular tissue it is especially prone to originate severe symptoms of inflammation (redness, swelling, flow of tears, itching, and shooting pains), and which, when situated at the inner angle of the eye, bear some resemblance to those of dacryocystitis. Sometimes it migrates from one eye beneath the skin of the nose to the other eye.

DISEASES DUE TO TOXINS AND OTHER CAUSES.

Lacquer poisoning is acquired in two ways; either by direct contact with the lacquer, or through the fumes arising from it by evaporation. The symptoms, which develop in a few hours, are fever, œdema of the skin of the face, limbs, etc., nasal and conjunctival catarrh.

Loliismus.—This is a form of intoxication caused by the ingestion of the seeds of *Lolium temulentum.* Loliismus has been known since Roman times. It occurs in the Punjab and the northwest Provinces of India and in Europe. The affected persons become very giddy and stagger about as though drunk, and at the same time suffer from impairment of vision with dilated pupils, green vision, great prostration, etc.

Vanillismus.—This is a form of poisoning by the dried fruit of *Vanilla plantifolia* (Andrews).

Men working with the fruit may suffer from conjunctivitis, fits of sneezing, and a skin eruption called "vanilla itch." It is believed that the irritant producing these symptoms is the *Tyroglyphus farinæ.*

Quinine amblyopia and amaurosis.—Either of these conditions may follow the administration of large doses of quinine in malaria.

De Schweinitz states that in most instances quinine amblyopia or amaurosis follows the ingestion of a large quantity of the drug, but he has seen 12 grains produce decided temporary amblyopia in a susceptible and neurotic woman. He also states that the clinical features of quinine amaurosis are total blindness, extreme pallor of the optic disks, marked diminution in size of the retinal blood vessels, and contraction of the field of vision. Other symptoms that have

been noted are diminution of color and light sense, dilated pupils, immobile iris, and occasionally anæsthesia of the cornea. The restoration of central vision may be perfect or incomplete. The disk may remain pallid and atrophic-looking years after the poisoning; in other instances it resumes its normal tint. The contracted field of vision gradually widens, but does not regain its normal limits.

Methyl-alcohol blindness.—According to De Schweinitz the amount of wood alcohol which may cause blindness represents a varying quantity. Blindness and atrophy of the disk have followed the ingestion of 2 to 5 drams. This drug in the form of an adulterant for ethyl alcohol in cheap whiskies, wines, and native drinks is capable of producing the most violent toxemia and visual disturbances, including toxic amblyopia, optic neuritis, and optic atrophy.

Amblyopia in general.—Amblyopia more or less complete may arise under the toxic influence of tobacco, alcohol, coffee, cocaine, and many other toxic agents. Tobacco is used freely by both males and females in Cuba, the Philippines, and other tropical countries, and it is believed to be a fair assumption that toxic amblyopias are more common among the inhabitants of the Tropics than in other parts of the world. All of these poisons directly affect the optic nerve.

Beriberi.—Weeks states that spasm and paralysis of ocular muscles, atrophy of the optic nerve, and neuritis have been observed in this affection.

Keratomalacia.—This condition is frequently observed in Brazil among the badly nourished children of the negro slaves.

Endemic paralytic vertigo.—This disease is known in France, Switzerland, Japan, and in the Island of Shikoku. According to Castellani and Chalmers the etiology is entirely unknown, and hence there are many theories which suggest alcohol, poisoned bread, and latent malaria; but the one that is favored by both Gerlier and Miura is the association of the disease with stables. Further it is associated with warm weather. An attack begins with a blurring of objects, everything appearing as if in a fog, together with ptosis, and less frequently a diplopia due to paralysis of the external rectus, with sometimes photophobia, disturbances of color vision, and hyperæmia of the optic disk. Then follow disturbances of speech, with paralysis of the muscles of the neck and back, etc.

Japanese river fever.—Manson states that so far as known "tsutsugamushi," or Japanese river fever, is confined to the banks of two rivers on the west side of the Island of Nippon. The Japanese attribute this disease to the bite of an *Acarus* resembling the *Leptus autumnalis* of Europe. Men, women, and children are equally susceptible. Conjunctivitis is almost always present (Scheube).

The palpebral conjunctiva in particular is much reddened, and in the mornings the eyelids are stuck together. At the same time the whole eyeball appears to be swollen, prominent, and staring.

Smallpox.—This disease occurs in the Tropics probably with greater frequency than in other parts of the world because many of the natives of tropical countries are not vaccinated. Weeks states that before the days of Jenner 35 per cent of the blindness in France was said to be due to smallpox. The lids are the site of the pustules in 20 to 30 per cent of cases, and may become very œdematous, preventing opening the eyes. Pustules may appear on the conjunctiva, at the puncta, and on the cornea, causing all degrees of destruction of the corneal tissue. It is believed that the suppuration that follows the development of a pustule on the cornea is due to secondary infection and that it can be prevented by suitable asepsis. Subconjunctival hemorrhages may occur in hemorrhagic smallpox. Retinitis, glaucoma, parenchymatous keratitis, and paralysis of the eye muscles have been observed in smallpox. Vaccine vesicles (vaccine blepharitis) may form on the lid margins from accidental inoculation—e. g., with the finger nail previously in contact with vaccine pox or vaccine virus. The vesicles may develop into a severe ulcer and the bulbar conjunctiva may be involved.

Congenital leucoderma.—This affection is found in the Tropics more frequently than in Temperate Zones and is characterized by congenital absence of pigment in the skin, hair, iris, and choroid. The iris is rose colored and the pupil red. There is intolerance of light and nystagmus in some cases.

Goundou.—A disease of unknown causation characterized by a bony swelling, usually bilaterally symmetrical, situated on each side of the nose. When the tumors have attained considerable dimensions, they obscure the line of vision and cause the patients to squint; atrophy of the eyeball occurred in a case recorded by Macland.

Oscinidæ latreille, 1804.—"In Ceylon there is a curious little fly that hovers in front of the eyes, therefore commonly called the 'eye fly,' which is an unknown species of the genus Oscinus Latreille, 1804. This little fly is suspected, after the experiments of Sir Allan Perry and Castellani, to spread the Koch-Weeks bacillus and to cause severe conjunctivitis." [4]

Trachoma (granular conjunctivitis—Egyptian ophthalmia—Military ophthalmia).—The geographical distribution of trachoma is very wide, the Mongolian race being especially liable to the affection. In this country it is found chiefly among the foreign-born population of the great cities. The Indians of our country are frequently attacked, while pure Negroes are almost exempt. Axenfeld states that the cause of trachoma is still quite unknown; neither in the secretions

nor in the contents of the follicles have any microbes been demonstrated which can be considered to have a causal significance. Halberstaedter, Prawoczek, and Greeff report that by means of the Giemsa stain they have recently found fine red-stained granules. Prawoczek states that they are certainly parasitic and calls them "chlamydozoa." Greeff is more reserved upon this point. Meyerhof examined fresh cases of trachoma for the spirochætæ by means of the Giemsa stain, and Stock examined secretions by means of the silver method; neither found anything definite. The ordinary saprophytes alone are commonly found, in some cases mixed with the common organisms causing conjunctivitis. It is quite certain that these latter are not capable of producing a true trachoma, with scar formation and pannus. Axenfeld further states such mixed infections, especially with the Koch-Weeks bacillus, the pneumococcus, and the gonococcus, give trachoma the appearance of an acute catarrh, though such is not its true nature. In different places the nature of the secondary infection varies, and with it the severity of the secondary catarrh. An examination of the secretion is therefore indispensable, and it is only when such infections have subsided that an opinion can be formed with regard to the nature of the follicles. Microorganisms (designated "trachoma cocci") have been found by Michel and Sattler, and more recently by Gouldschmidt and many others. They are not constant (Schmidt-Rimpler) and are not the cause of the condition.

Axenfeld also states that, though we still find persons who believe that this disease is not contagious, its infectious nature is established beyond all doubt. There are positive inoculations (Sattler) to prove it. Acquired immunity can not be demonstrated, reinfections are not uncommon, and a trachoma that has long been in a state of quietness can break out again. No life period is proof against trachoma in any trachomatous district. The particular age at which infection most commonly takes place naturally depends on the local conditions, and will vary in different localities. The view is gaining ground that in many countries the disease is acquired in early childhood. This is stated to be the case in Amsterdam (Straub), for the greater part of Russia, and particularly for Egypt, where large series of experiments by L. Muller and Morax have shown that in children of the first year trachoma is already widespread and, as in adults, is often combined with other infections.

Gangosa (*Rhinopharyngitis mutilans*).—According to Castellani and Chalmers rhinopharyngitis mutilans is an ulceration of the palate or pharynx of unknown cause, which slowly spreads to the nose and larynx, destroying cartilage and bone, and causing much deformity. Mink and McLean, who have studied the disease in Guam, state that there is absolute proof that gangosa has existed in the island of Guam

for at least 150 years, and probably much longer. In 1828 the Spanish royal commission sent to investigate conditions in the Ladrone Islands reported gangosa as being prevalent and recommended that these cases, cases of leprosy, and large ulcerations be isolated in one of the smaller islands of the group. This is the earliest official recognition of the existence of the disease and the name gangosa.

The authors further state that the known distribution of gangosa is indefinite. It exists throughout the Ladrone Islands, Guam, and the Caroline Islands. Surg. J. F. Leys, United States Navy, has carefully studied the bibliography and mentions the existence of rhinopharyngeal ulcerations in Fiji, British Guiana, Jamaica, Italy, Dominica, Ceylon, and Nevis. Briefly, the disease is described by Mink and McLean as characterized by a destructive ulceration, usually beginning on the soft palate, pillars or uvula, and extending by continuity to the hard palate and nasal cavity, larynx, and even to the face. Active ulceration is followed after a variable period by cicatrization or chronic ulceration. Mutilation always results. The same authors give the following description of the eye lesions found in this disease:

> The eyes become involved when facial ulceration destroys the lids. The sequence in destruction is conjunctivitis, corneal opacities, staphylomata, and finally blindness.

In a recent article on this subject Passed Assist. Surg. H. A. Garrison, United States Navy,[1] who was stationed in Guam for some time, states that there were 324 cases of gangosa on the island of Guam, and of this number over 100 had active lesions. In March, 1910, in a conference with Surg. H. E. Odell, United States Navy, it was decided to try mixed treatment in these cases. Dr. Garrison further states that when he left Guam on the 27th of August, 1910, there were only about 20 cases in all with open lesions, and of these only 5 or 6 with lesions of any size. In conclusion, he expresses the opinion that from a clinical and therapeutic standpoint the disease known as gangosa is syphilis in a very late stage, and that mercury and potassium iodide will cure it.

Surg. H. E. Odell, United States Navy, senior medical officer of the island of Guam, in a very recent report to the Surgeon General of the Navy, gives a series of 46 cases of gangosa in which the Wassermann test was made, with a positive reaction in 34 cases, partial in 9, and negative in only 2 cases.

All of these patients had active lesions when examined, and in many cases the lesions had existed for several years. Under mixed treatment they had all recovered or showed marked improvement.

In the light of these more recent experiments and investigations it would seem that gangosa must be a stage of syphilis, although, so far

[1] Bull. of the Manila Medical Society, vol. 11, Oct. 10.

as known, the *Treponema pallidum* has not yet been found in any of the secretions or lesions.

Myiasis.—Many flies deposit larvæ in wounds and ulcers in the skin or on mucous surfaces. Some deposit larvæ which are capable of penetrating the skin, and in others the larvæ are themselves blood-suckers. To all of these affections the term myiasis is applied. In South America, according to Daniels and Alcock, the most important and dangerous form of myiasis is that due to the *Chrysomyia macellaria*. This fly usually attacks some junction of skin and mucous membrane, and the larvæ then attack the mucous membrane. The most frequent place attacked is the nose, but they are also found in the orbit. The larvæ are popularly known as "screw worms." Wherever they occur they cause extensive destruction. The larvæ bury their heads in the tissue, which they destroy, and cause an extensive cellulitis. The depth and extent of their ravages are best seen in the orbit. The lids, muscles, and connective tissues are rapidly destroyed, whilst the eye, protected by the thick sclerotic, is not at first affected. According to the same authors, the *Chrysomyia macellaria* is a fly that varies in color from blue to green. Badly kept hospital wards, such as those in an undermanned leper asylum, are very liable to become infected by previous cases, as the pupæ are not looked for and are allowed to hatch out, when they may reinfect other patients.

In conclusion, I desire to express my appreciation of the valuable suggestions offered by Surg. Charles St. John Butler, United States Navy, in connection with the preparation of this paper.

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INTRAVENOUS ADMINISTRATION OF SALVARSAN.

[Further report from the United States Naval Hospital, Norfolk, Va.]

By Passed Asst. Surgs. GEO. B. TRIBLE and HARRY A. GARRISON, United States Navy.

Since the publication of the report on the administration of "606" in the April number of the United States Naval Medical Bulletin, the intravenous administration of salvarsan has been continued at this hospital, employing the technique previously described. In a few instances variations from that method were tried but were found unsatisfactory. The Schreiber needle was found less useful and more difficult to manipulate than the canula, and always necessitated the selection of a much larger vein than was found necessary in the former method; consequently the use of the needle was discontinued. The needle possessed the advantage of conserving in most instances the permeability of the vein, but ligation of superficial veins has not caused any impairment of the circulation so far as can be observed.

No untoward symptoms have occurred during six months employment of the intravenous method. The total number of administrations to June 1 was 240. Recurrences have been noted in three cases, due primarily to insufficient dosage, or rather to timidity in administering the preparation to patients who were unwilling to take the treatment, and who were discharged to duty before the administration of the second dose in two cases. The third case, although the third dose was given, was of the lymphatic type, with poor physique, enlarged tonsils, and general enlargement of the glands. The glandular enlargement and enlarged tonsils probably afforded foci for systemic reinfection. The third dose was given in two instances; the lesions healed as promptly after the third administration as after the first, showing that in these cases at least a resistant strain of treponema had not developed.

The Noguchi modification of the Wassermann reaction has been adopted and used in as many cases as practicable. It is not used as a means of diagnosis in primary or secondary syphilis in which lesions with treponema are found. The methods of demonstrating the treponema used have been staining by the Levaditi method in section, or in smears by the use of the Giemsa method of staining. Later the india-ink method was adopted because of the facility of its application and the uniformly good results, which are not always obtained in smears stained by the Giemsa method.

A negative Wassermann reaction has been very difficult to obtain, occurring in only a little over 10 per cent of the cases examined. It has been unfortunate that the exigencies of the service render it impossible to keep these cases under observation a sufficient length of time to determine definitely the percentage of negative Wasser-

mann reactions that are obtainable. The average duration of stay in hospital after the second dose is about two weeks. A negative Wassermann reaction can not be expected in this time in most cases. However, in one case under observation over 70 days the Wassermann remained strongly positive.

The cases reported in detail have been the failures, recurrences, and those of special interest; all other cases cleared up rapidly, with uneventful courses.

Case H. R., coal passer, United States Navy, was admitted to this hospital from the U. S. S. *Solace*, September 21, 1910, with diagnosis of secondary syphilis, evidenced clinically by numerous mucous patches and plaques on tongue, pillars of fauces, and on buccal mucous membrane. General glandular enlargement and anemia were also present. He had previously been under treatment at the Naval Hospital, New York. At this hospital he received mercurial treatment by several methods. The injection of the bichloride, one-sixth grain every second day, combined with increasing doses of potassium iodide, were adopted finally as the most effective remedy, and this merely held the disease in check, causing no healing of the lesions. Patient's condition was most pitiable and he could not swallow without suffering intense pain. Having read accounts of the new remedy "606" in the magazines, he was very anxious to take it.

At that time it was impossible to procure the preparation, but in the latter part of January, 1911, a 0.6 gram dose was given, mercurial treatment having been discontinued for a period of two weeks before. Within 12 hours there was a diminution of pain on swallowing, within 24 hours there was no pain, the mucous patches began to clear, and the glands to decrease in size. There was a rapid increase in weight during the first week, a gain of about a pound a day, and the patient felt better than at any time since his infection. From the ulcerated condition of his throat he contracted an otitis media of the suppurative type, which did not yield to antiseptic treatment. Neither did this clear up after the administration of salvarsan. As a child he had suffered from what he termed "running ears." His diagnosis was changed to otitis media on February 12, 1911. There were no clinical evidences of active syphilis at this time. On February 15, 1911, a second dose of 0.6 gram of "606" was given with an uneventful course. On March 22, 1911, a simple mastoid operation was performed, opening the antrum on the left side. The mastoid was found dense and sclerotic, diploetic in type, and the antrum was filled with granulations, which were removed. The drum was freely incised, and a small drain left in the antrum. The healing of this wound was without interest. Patient was discharged to duty on May 12, 1911, no clinical evidences of syphilis

remaining, but giving a strongly positive reaction. Mercury and potassium iodide were discontinued throughout this interval as an experimental measure, but he was advised to report to the sick bay and continue treatment. It is probable that his life was saved by salvarsan, since he had not been benefited by the most heroic mercurial treatment; he was mentally depressed and contemplated self-destruction as a means of ending his troubles. It will be interesting to note whether or not there occurs a return of his active symptoms.

The following case was of interest owing to the rapid destruction of tissue which was taking place despite vigorous mercurial treatment:

Case W. W. P., corporal, United States Marine Corps, had a primary lesion about six or seven months prior to admission to this hospital. The patient was about 25 pounds under weight, very weak and anemic. He had large ulcers on his soft palate, the uvula had sloughed away, and there were deep ulcers on the anterior pillars of the fauces and on both tonsils. The lesions were very malignant and the mucous membrane of his throat and mouth had a peculiar honeycomb appearance. On March 12, 1911, a dose of 0.6 gram of salvarsan was given. The patient was very weak and nervous, crying and moaning incessantly during the administration. Improvement began within 24 hours and progressed until about the seventh day, when the condition became stationary. On the fourteenth day a second dose was given, improvement immediately started and continued until all lesions were healed completely about the twentieth day. In the stationary period of healing of the open lesions his general condition continued to improve. He was discharged to duty on the twenty-sixth day from the first administration, having regained his normal weight, and his mental depression had entirely disappeared. In the case of this patient the first dose was insufficient completely to heal his open lesions, and it is probable that a third dose should be given in the near future, for though clinically cured at the time of his discharge he gave a positive Wassermann. In a case of this kind mercury and potassium iodide should be continued for a year at least, or until the patient gives a negative Wassermann and continues to do so for a period of a year.

The next case presents several points of interest. The history is as follows:

Case D. J. E., hospital apprentice, first-class, United States Navy, denied venereal sore except the following: In September, 1910, immediately after intercourse he noticed a small abrasion on his prepuce, which he thought was a "hair cut;" this was cauterized with carbolic acid and alcohol. A small indurated area was left, which persisted for several months. Two months later he began to notice pains in both shoulders and over his left breast. About two weeks after he com-

menced to suffer intense headaches, chiefly frontal. About this time there was considerable disturbance of vision and equilibrium. He was admitted to this hospital on February 9, 1911, with a diagnosis of rheumatism. At that time he suffered considerable mental disturbance, was extremely unruly, and at times almost maniacal. His blood was repeatedly examined for malaria and was always found negative. He had a low, irregular fever. Examinations of ears and eye grounds were negative. His diagnosis was changed to syphilis on March 5, 1911. Small mucous patches, intense headaches and bone pains, worse at night, were the clinical signs of syphilis. A Wassermann reaction was strongly positive. It was considered that this was a cerebral or meningeal involvement. A dose of 0.6 gram of salvarsan was given on March 6, 1911. Within four hours after administration he had marked diarrhea, most intense headaches, a chill, nausea, some vomiting, and a fleeting macular eruption. His température reached 102° F. The next morning improvement was noticeable and continued for several days, when the patient remained overtime from liberty five days. Upon his return he refused further treatment, claiming that he had never had syphilis. He admitted, however, that his condition had improved, but thought that it was not due to his treatment. He was discharged to duty and was not heard of until May 12, 1911, when he was readmitted with the following symptoms: Intense headaches, dizziness, and marked mental depression, at times almost irrational. His pulse was high, from 100 to 120, but his temperature was only slightly elevated. Upon examination it was found that he invariably tended to swerve to the right when walking with his eyes closed, and he gave a history of dizziness and a tendency to fall to the right. Vestibular examination was unsatisfactory because of the constant nausea and dizziness, which interrupted the tests. On the whole, his condition appeared hopeless. He had been taking mercury and potassium iodide in full doses without any relief; in fact his condition was becoming worse. At this time it appeared that he had a syphilitic involvement of the labyrinth. On May 15, 1911, an intravenous injection of 0.6 gram of salvarsan was given at the patient's urgent request. Improvement was almost immediately perceptible and there was only a slight reaction. He now walks with only slight deviation to the right, has no headache nor dizziness, and his mental symptoms have disappeared. During the past two weeks he has gained 8 pounds in weight and has begun to play baseball in the grounds of this hospital. He is receiving mercury and potassium iodide in full doses for its absorptive action and is awaiting a third dose of salvarsan.

The next two cases are examples of lymphatic diathesis and suffer from latent tuberculosis. They are cases of recurrence.

Case P. C. W., fireman second class, United States Navy. General physical condition is poor. There is history of repeated colds and sore throat with "rising in his head" from childhood. Examination shows healed perforation of each ear drum with impaired hearing. Syphilitic infection was acquired in November, 1910. Patient was admitted to this hospital during February, 1911, as with secondary syphilis. Mucous patches were present in his throat and on the tonsils at the time of admission. There was marked glandular enlargement. First dose of salvarsan was given on February 9, 1911. All his lesions cleared up within a week. He refused a second dose and also refused to have his tonsils removed, although they were hypertrophied and embedded. He was discharged to duty with no open lesions. Von Pirquet's tuberculin reaction was strongly positive. The glandular enlargement in this case did not subside to any extent. On April 15, 1911, he returned to this hospital with several mucuous patches on his tonsils. He also had a marked glandular enlargement with a very large mass of glands in the right submaxillary region. A second administration was given and the open lesions healed as rapidly as before, the glandular enlargement subsided to some extent with the exception of those in the submaxillary region. Under general anæsthesia this mass was removed, and the glands were found broken down and caseous. They were probably tuberculous. There is no question that mercury and potassium iodide should be continued for some years in such cases. No untoward symptoms developed during the operation which occurred only a few days after the administration of salvarsan.

Regarding operative procedure following the intravenous method of giving "606" there appears to be no contraindication. Several cases have been circumcised the day previous to administration of the drug and several on the day following with no undue hemorrhage and no ill effects from the cocaine. Numerous experiments have been made to determine the effect on the coagulability of the blood after the intravenous injection of the saline solution of salvarsan and practically no difference could be determined. It is possible from a theoretical standpoint at least that a too alkaline solution or a solution in some medium foreign to the plasma would make a difference either in the coagulability or the alkalinity of the blood and might readily be so deleterious as to cause hemolysis or on the other hand to cause a spontaneous clotting.

This is the second of the two cases of lymphatic diathesis in which there was recurrence. In this case recurrence occurred after the second dose.

Case F. G. G., seaman, United States Navy, contracted an initial lesion about four months prior to admission to the hospital. At time of entrance to the hospital he had mucous patches on the tonsils and

pharynx. He had a very narrow face with a high palatal arch and was a mouth breather. His nares were extremely small and could not have been improved by operation. He was given his first administration of "606" on March 6, 1911, all open lesions healing within a week. After an interval of 16 days he was given a second dose and a few days later discharged to duty. He was readmitted to the hospital on April 27, 1911, with a mucous patch on the anterior pillar of the left tonsil. A third dose was given at once, and the healing was as prompt as after the first. The vein used in the third administration was a tributary of the long saphenous, taken just above the internal malleolus. It is evident that in this case there did not develop an arsenic-resistant strain of treponema. This case also gave a strong Von Pirquet's tuberculin reaction, but no tubercle bacilli could be demonstrated in the sputum. He had hypertrophied tonsils and general glandular enlargement which he claimed existed before he acquired syphilis. Like the preceding case, this and all other cases of marked glandular enlargement are especially prone to recur and should receive mercury and potassium iodide.

Attention is invited to the fact that recurrence in these three cases occurred within six weeks from time of treatment.

The next two cases showed secondary eye symptoms.

Case E. M. P., ordinary seaman, United States Navy, was admitted to this hospital April 20, 1911, with history of initial lesion September 20, 1910. Upon admission his general condition was poor. He was very anemic and emaciated. Severe iritis was found in left eye with posterior synechiae; deposits were on the posterior surface of the cornea and the anterior capsular surface of the lens. There was some cellular exudate in the aqueous but the vitreous and choroid were unaffected. Vision was less than 5/20 in the left eye. Lachrymation and photophobia were marked. Diagnosis, syphilitic iridocyclitis. Local treatment by atropine and hot applications was commenced at once. On April 23, 1911, a 0.6 gram dose of "606" was given and within two days vision increased to 15/20, left eye; the iritis cleared up, the photophobia and lachrymation disappeared, the exudate was absorbed, and by the end of a week with the exception of the synechiae and a few heavy deposits on the anterior surface of the lens, the eye was normal. The second administration was given in the same quantity on May 7, 1911. All the symptoms had disappeared after the first administration, but the patient was held for observation until May 18, 1911, when he was discharged to duty with normal vision. It is highly improbable that this result could have been obtained in less than six weeks under active mercurial treatment.

The following case is rather unusual and presented difficulties of diagnosis.

Case S. J. S., quartermaste', second class, United States Navy. Admitted February 27, 1911, with double orchitis which was apparently not of gonorrheal origin, although he gave a history of gonorrhea five years previous to admission. There was no definite history of venereal sore with the exception of what he termed "blisters" which healed with application of burnt alum in a few days. These blisters are said to have occurred about a year previous to his admission. The patient was burly, well nourished, and gave no history of rheumatism of any description. Within a few days after admission to the hospital he noticed an inflammation of his right eye which was found to be a mild episcleritis. This was treated locally and salicylates were administered internally without apparent result. No evidence of gonorrhea being found, his diagnosis was changed to hydrocele, as there was a small amount of fluid in the tunicæ. He was discharged to duty because his condition did not seem of sufficient moment to warrant operative procedure. He was readmitted May 18, 1911, with a diagnosis of orchitis and a mention of an inflammation of his right eye, which had grown worse progressively. Upon examination it was found that in the equatorial region of the right eye toward the outer limbus he had a large boss about 1 centimeter in diameter and of about 15 millimeters elevation, approaching purple in color, painful, and in addition to involving the episcleral tissue, the lesion probably involved the sclera. Distance vision was unaffected, but he complained of a haze and pain on focussing for near vision. Syphilis having been previously suspected, a Wassermann was done and proved strongly positive. On May 28, 1911, a 0.6 gram dose of salvarsan was given and within 24 hours the pain had almost disappeared. At the end of the third day the purplish color had disappeared, the elevation subsided, and at this time he has merely a pinkish discoloration at the site of the former elevation.

This is considered worthy of special mention, owing to the heretofore obscure etiology of this affection. The previous etiological factors most commonly given have been rheumatism, gout, and gonorrhea. Syphilis has been thought rarely to affect this portion of the eye (i. e., episcleral tissue).

The orchitis in the above case is undoubtedly a sarcocele of syphilitic origin as it is resolving.

Several cases of syphilitic nephritis have been treated, as well as other case of nephritis merely coincident with syphilis. So far as can be made out, albuminuria is no contraindication to the treatment. No case of hemorrhagic nephritis such as reported by some authors has been seen.

The following is a remarkable illustration of the beneficial action of "606" in a severe syphilitic case. From the severity of the infection and its long standing, together with the broken-down

condition of the patient, as result of his disease and a life of excesses, a permanent restoration to the normal was hardly to be expected.

Case S. G. W., private, United States Marine Corps. On the Asiatic station he suffered from hemiplegia of syphilitic origin, which with the exception of a slight facial palsy had cleared up under mercurials. While under treatment for the hemiplegia his nephritis was first noted, this being nearly a year prior to his admission to this hospital, on February 20, 1911. His condition was most critical. He was helpless, feet and legs were extremely swollen and very sensitive. There was superficial necrosis of the tips of the toes of both feet, and the heart was weak and irregular. Urine examination showed some albumen and casts. Owing to his poor condition, the advisability of administering "606" was in question. Since he was progressively growing worse under the usual treatment for nephritis, it was decided to take the risk. He was given a full dose with no symptoms of note, but extreme care was exercised and the solution administered very slowly. Slight improvement was noted the following day; the edema decreased, the necrotic skin was exfoliated, and the feet and legs began to assume the characteristics of a mild cellulitis. In about 10 days after the administration he was able to stand on his feet, but the plantar surfaces were very sensitive. On the twentieth day after the first administration he was given a second. Within three or four days the edema disappeared, the feet became less sensitive, and within a week he was able to wear shoes. By the end of the second week the urine was free from albumen and casts and he was doing light duty around the ward. He was finally surveyed and discharged from the service because of his bad health record and his dissolute habits.

In this series of cases there have been three in which syphilitic involvement of the liver was present. With the exception of one case in which there was a severe reaction, prolonged vomiting, chills, and a macular eruption lasting for about 24 hours, the course of these cases was toward a rapid and uneventful recovery, the jaundice clearing up within a week. Liver involvement is considered no contraindication to the intravenous method of treatment. It has been reported by some observers that salvarsan introduced intravenously tends to accumulate in the liver. This has been disputed by others and does not correspond with the action of arsenicals in similar circumstances. It has been found in animal experimentation that arsenic is excreted as rapidly when injected into the jugular as when injected into the mesenteric veins, showing that the liver in these cases does not tend to take up the arsenic passing through it.

Among the odd cases of infection there occurred one primary infection on the dorsum of the second phalangeal joint of the right

index finger. This patient, a master-at-arms, had been bitten by a syphilitic prisoner. The lesion showed the treponema and healed promptly after treatment. There was one primary lesion on the scrotum which was excised, treatment given, and the wound healed by first intention.

One patient had double primary sores, one on the prepuce and the other around the nail of the left index finger. Both healed promptly under treatment.

One case presented a primary lesion on the frenum of the upper lip, accompanied by marked enlargement of the cervical glands. This also made an uneventful recovery.

The Wassermann reactions have become negative in a little over 10 per cent of the cases examined, and became decreased in intensity in another 10 per cent. The earliest negative reaction was recorded in 14 days, the latest in about 50 days. One reaction remained positive over 70 days, although clinically there were no manifestations of active syphilis. Owing to service conditions it has been impossible to keep these patients under observation a sufficient time to determine exactly the percentage of later negatives or to determine if those that have become negative return to the positive reaction later. There have been three or four cases in which no marked benefit occurred. There have been no cases in which harm has come to the patient in any way from the use of salvarsan, and the series embraces cases of nearly every description. An alarming case of pseudo-blindness in an hysterical individual proved to be compound hyperopic astigmatism which had never been noticed by the patient prior to this time. Upon its correction there was no further trouble.

In common with other observers we have found that papular syphilides and rupia are uncommonly persistent, no doubt due to their histological structure. It is our belief that all initial lesions should be excised when practicable, all gummatous masses removed by dissection or curetting, all large masses of glands removed and tonsillectomy performed in cases showing hypertrophied or embedded tonsils. It is evident that these furnish foci for reinfection. To obtain a sterilization the salvarsan must come into immediate contact with all the organisms. An understanding of the microscopic pathology of the above-mentioned conditions makes it clear that the treponema in these locations is so well protected that it is doubtful if any medicine can affect it.

The absence of untoward symptoms in this series of cases may be explained in several ways. First, we are dealing for the most part with a selected body of men physically in the best surroundings. Second, as a rule we are dealing with a much less malignant infection than that commonly seen abroad. We believe that many of the

unfavorable results and complications reported from the European clinics are due to the freeing of an overwhelming quantity of endotoxins into the circulation or to the malignancy and virulence of the infection itself. Third, the intravenous method here employed lessens the chance for any serious complications due to arsenic per se, because of its rapid excretion and because it circulates with probably only a slight change in its chemical formula. Whereas in the intramuscular method there are pockets of the solution remaining for weeks which often break up and liberate arsenic in its pure state or as new and unknown chemical compounds. Fourth, the utmost care in its administration has been observed. The solutions have been carefully prepared, and are, as nearly as possible, isotonic with the blood, and are in sufficient dilution. The temperature is kept a little above body temperature and a sufficient time is consumed in its administration to allow the vessels to accommodate the extra amount of fluid. In full-blooded individuals it is sometimes necessary to abstract blood to the amount of about half the quantity of the solution introduced. Fifth, the patients are required to lie in bed for a period of 18 hours after administration.

In reference to the complication of the organs of special sense which have been reported, it would appear that in some instances these complications are simply reactions analagous to the Herxheimer reaction. The organisms being generally distributed, occur in these organs, and their destruction and the liberation of toxins incident thereto can set up a reactive inflammation which may cause the symptoms noted. Of course, arsenic itself, if absorbed in the circulation in common with quinine, salicylates, and other drugs, may cause hemorrhages into the internal ear, or at least considerable functional disturbance. No case of tinnitus aurium has been noted in this series. The optic nerve lesions reported were generally found to be the result of improper preparation of the drug (as in the cases in which methyl alcohol was used in its preparation) or it was found that the patient had previously taken atoxyl or some similar preparation of arsenic. Danger of embolism is a remote possibility.

We regard marked arteriosclerosis, aneurism, or weak heart as the only contraindications to the intravenous administration of "606." A cirrhotic liver of long standing, not syphilitic in origin, would probably suffer considerable irritation. The full ampule should not be given in less than 300 cubic centimeters of solution, and less than a full ampule is not considered an adult dose. In the very small or in children the dosage should be calculated by body weight. Good results are to be expected in all cases where a positive diagnosis has been made, but "606" can not replace destroyed tissue and in giving a prognosis benefit can be assured only so far as there has been no destruction or degeneration of tissue. Gummatous

cases, if the gumma can not be excised, should be given heroic doses of mercury and potassium iodide coincidently with the administration of salvarsan, and especially for two weeks before the second administration. The reason for this is to get as much absorption as possible and thereby reestablish a normal circulation. It is impossible to assure any action on the treponema unless the blood stream reaches it. As to the question or advisability of giving a third dose in cases of recurrence there is probably no danger; in the cases in which it has been done the healing was as prompt as before. It is possible that continued repetition of the dosage would cause an arsenical degeneration of the liver and kidneys, and probably a primary optic atrophy.

An ideal treatment would be this: In primary lesions thorough excision as soon as diagnosed, two intravenous administrations of salvarsan at intervals of 10 days, followed by an active mercurial treatment by injection or inunction for a period of 3 months. This would attack the infective agent from every standpoint. We are of opinion that there will be no recurrence in a primary case treated as above. In secondary and tertiary stages the treatment should be combined with mercury and potassium iodide. In the late manifestations the results are as a rule not so striking as in the primary and secondary lesions.

The treatment of syphilis with salvarsan is of a particular advantage in the service, either alone or in combination with mercurials. As mentioned in the previous article the great majority of cases of syphilis seen in the service are primary and secondary. It is these very cases that can be returned to duty within an average time of three weeks with all lesions healed. Many are ready for duty within two weeks or less. In addition to clearing up the active lesions there is usually a rapid gain of weight, a great improvement in the general well-being, and in many cases a peculiar mental exhilaration the causative factor of which it is impossible to determine.

Our thanks are due to Asst. Surg. Luther Sheldon, jr., for his valuable assistance in the determination of the Wassermann reaction in these cases, and to Hospital Steward Saunders for his willing and intelligent assistance.

THE MENTAL EXAMINATION OF FIFTY RECRUITS WHO BECAME INSANE SOON AFTER ENLISTMENT.

By Passed Asst. Surg. HEBER BUTTS, United States Navy.

It is a somewhat singular fact that until very recently the medical officers of the armies and navies of the world, in their examinations of recruits for enlistment, have paid little or no attention to the defects of the most important organ of the body, the brain. The attitude of indifference heretofore manifested toward this important

problem, the solution of which is daily becoming more and more imperative, has been largely due to two facts: First, the impossibility of formulating a normal mental standard of examination by which all recruits may be measured; second, the lack of opportunities for medical officers to acquire a knowledge of mental diseases and their manifestations.

A defective mental make-up is not usually as easily recognized as an inguinal hernia or an ingrowing toenail. To ascertain the mental condition of any individual it is usually necessary to do something more than inspect, palpate, and measure his skull, or follow any other procedure prescribed for the physical examination of candidates for enlistment. At the present time it is at least impracticable, if not impossible, to measure mental capacity. A man may be a veritable Apollo Belvedere in point of physical perfection and yet be mentally defective. Every insane enlisted man from the Army, Navy, or Marine Corps proves this statement to a greater or lesser degree because he was required to pass the prescribed physical examination in order to enlist.

A mentally defective individual is much more handicapped in the struggle for an existence than an individual who is physically defective. This is even more true in the naval or in military service than it is in civilian life. An individual with a small hernia or a varicocele, with flat foot, cardiac disease, defective vision, color blindness, or who has almost any of the physical defects which are causes for rejection of candidates for enlistment in the Navy or Marine Corps, may succeed in living to a good old age, be self-supporting, acquire a competency, or even become famous, if naturally endowed with the requisite mental qualities and a sufficient amount of energy and inclination to work. A large part of the world's best work has been done by individuals who, aside from the question of sex in the case of women, would undoubtedly have been rejected for enlistment in the United States Navy on account of physical defects, if they had applied. But if an individual is mentally defective, his efficiency is generally almost, if not entirely, at an end, especially when he begins to fail to adapt himself to his environment. Then it is that the splendid physical machine counts as much for naught as would a splendid locomotive without an engineer and a track upon which to run. The brain, therefore, is the most important organ of the body and the one most difficult of examination, both on account of anatomical location and on account of the inapplicability of the ordinary modes of examination.

In order to get a proper perspective of the mental capabilities of an individual it is necessary to take into account not only his immediate antecedents and, to a lesser degree, his collateral relations, but also a longitudinal section of his life. A cross-section of a cirrhotic

liver or a sarcoma will usually be sufficient for diagnosis, but a cross-section of a man's life history is seldom sufficient for a diagnosis of his mental condition. A longitudinal section of that life is necessary

It is at least unlikely that desirable offspring will come from insane, epileptic, hysterical, neurasthenic, psychoneurotic, tuberculous, alcoholic or drug intoxicated parents. As a broad general principle "like usually produces like," though there are numerous exceptions which may be said to prove this rule. Medical history furnishes numerous examples of epileptic, insane, idiotic, or imbecilic children who have been born of alcoholic or drug intoxicated parents, while the examples of really good physical and mental endowments from such antecedents are comparatively rare. Any life at any particular moment is the end result of two inescapable influences, heredity and environment, which make that life what it is. General history furnishes many examples of individuals, who, through a happy combination of fortuitous circumstances and the possession of sufficient energy and ambition, have risen above their environment and their fellows, and have made names and records which have lived after them. These are exceptions, however. In a general way, people are what their environment makes them. The boy who lives in a Catohlic household or in a Catholic community usually becomes a Catholic; if he lives in China, he is very apt to wear a queue and adopt the tenets of Confucianism.

In addition to his hereditary and environmental influences, each individual has personal life experiences which have a profound influence upon his daily conduct. These personal life experiences are as varied as they are numerous. Deaths of friends and relatives, unfortunate love affairs, disappointments, hopes, blighted ambitions, flattered vanities, frights, fears, secrets, dreams, narrow escapes from accidents or death, defeats and victories, sexual and psychic traumas are all forms of these personal life experiences which are constellated, as it were, about the hereditary and environmental influences of each individual, making him what he is at any particular moment. They really dictate his every act, his conduct, from day to day. These occurrences frequently change the entire course of a life, and one or more of them may make all the difference between success and failure in life. In other words, as Musser well puts it, certain psychoneurotic individuals "do not bear up in adversity, and they lack the mental poise to withstand the temptations of prosperity."[1] It will thus be seen that the influences which make any individual's character are very complex and very numerous, and in order to rightly understand that individual's present conduct, and what he is apt to do or be in the future, it is necessary to know

[1] J. H. Musser's Practical Treatise on Medical Diagnosis.

something, not only of his individual life experiences and the manner in which he has adapted himself to his environment in the past, but also something of his antecedents and their manner of living.

With a view to determine the practicability of giving each physically accepted candidate for enlistment in the Navy a mental examination, and also with a view to determine some of the types of men who have been enlisted in the past, and who by reason of unsound mind have soon become incapable of adjusting themselves to the naval environment, I have made a study of the life histories of 50 cases of insanity occurring in enlisted men. These cases were selected from about 300 cases of insanity from the Navy and Marine Corps who received treatment at the Government Hospital for the Insane, during some portion of the calendar year 1910. For obvious reasons, only those cases have been selected which were accessible, and mentally capable of giving a history of themselves and cooperating with the examiner. The results are shown in the 10-column table which follows. The insanity in all but 1 of these 50 cases became manifest during the first enlistments of the men affected, some of them within a very few days after enlistment. The one exception, No. 38 of the series, had served two full enlistments. He then remained out of the service for nearly four years, leading the nomadic life of a "hobo," a devout worshipper at the shrines of Venus and Bacchus, beating his way from one place to another on the railroads, and cherishing insane delusions whose origin long antedated his last enlistment. He admitted that he enlisted in the Navy after a long period of idleness and debauchery because he could find nothing else to do. It is somewhat remarkable that this insane man succeeded in remaining in the service a little more than 13 months in the capacity of ship's cook, before his failure to adapt himself to his surroundings in the Navy made it necessary to transfer him to an institution for the insane.

As this table is designed to show so nearly as possible the defective mental condition of the men at the time of enlistment, and not the result of syphilis or alcoholic habits acquired after enlistment, no case of general paresis or chronic alcoholic psychosis has been included in the table. Most of the cases are dementia præcox, though 2 imbeciles, 1 psychic epileptic, and 5 cases of manic-depressive insanity are included. The age limitations of these 50 cases vary from 16 years to 38 years, the average age being 23.72 years. Mental disorder became manifest in 5 of these cases within less than 15 days after enlistment. It became manifest in 8 cases within less than 4 months after enlistment; in 9 cases, within less than 8 months after enlistment; in 6 cases, within 1 year after enlistment; and it became manifest in the remainder of the 50 cases after 1 year of the enlistment had been served.

A large percentage of these cases belong to the riffraff of the country, and "from unfavorable surroundings prior to enlistment, and a bad heredity, they have had little or no chance in the struggle for social survival." Many of them were, prior to enlistment, "poorly born, poorly bred, poorly nourished, poorly clothed, mere social flotsam and jetsam of the human tide, and hardly likely to do much in life except propagate their kind." The most casual examination into the family and personal histories of a large percentage of these men should convince anyone of the unlikelihood of their being desirable men for the service. As stated in the column of "Remarks," many of these men were undoubtedly insane at the time of their enlistment; other psychopathic, constitutionally inferior individuals needed only the change from a civilian to a naval or military environment, with its accompanying discipline and unquestioning obedience of orders, to push them over, so to speak, the ill-defined border line separating the sane from the insane and causing them to be classed with the latter. A large percentage of these men had all their lives been used to a happy-go-lucky, devil-may-care existence, and they enlisted in the Navy or Marine Corps for a period of four years at the suggestion of a friend (?) or because they were out of work and "could not find anything else to do," or in a sudden burst of patriotism (?) in time of peace. Others frankly admit that they enlisted in the service on the impulse of the moment merely for "a trip around the world," or "to see what it was like," or "to get an easy job."

The family and personal history and the "General observations" of these 50 individuals are necessarily much abbreviated on account of lack of space, but an attempt has been made to give a few of the salient derogatory features in their lives which furnish contributory evidence of undesirability for the service from a mental viewpoint. The scheme of examination used for the collection of the facts presented in the table is described in the January, 1911, issue of the Naval Medical Bulletin. There are only 5 or 6 individuals in this list of 50 recruits whose physical defects are of such importance as to warrant their rejection for enlistment. The defective mentality is so apparent in the faces of many of them, however, that a mere glance should have been sufficient for decision as to their undesirability.

Where possible an endeavor has been made to give a very brief description of the habits of the insane enlisted men before they entered the service. There is no more important factor to be taken into consideration in the determination of the personal equation of men than their habits. A mental defective is frequently a moral defective, and vice versa. It is a profitless and almost hopeless task for the Government to attempt to break pernicious habits which may have begun to form in early childhood or infancy. The enlistment of chronic alcoholics, morphine and cocaine habitués, vagrants and profes-

sional "hoboes," masturbators, sodomists, sexual perverts, cantankerous individuals, "shut-in" characters, "day dreamers," liars, thieves, would-be suicides, former inmates of reform schools, penitentiaries, workhouses, and insane asylums, gamblers and stock-market "plungers" can hardly reflect credit on recruiting officers or the service, yet the table contains one or more representatives of each of these types of undesirable recruits. These are the individuals who are not only very poor types of enlisted men from the standpoint of efficiency, but they form a very large percentage of the courts-martial in the naval service because of their inefficiency, immoral habits, and inability or failure to adapt themselves to the naval environment. There are four general court-martial prisoners to be found in the list. Many more of the cases listed in the table would have been court-martial prisoners but for the fact that their defective mental condition was recognized before they received sentence for offenses which they had committed. As a result, the court-martial charges and specifications were withdrawn and the patient committed to an insane asylum instead of a naval prison. In either event, however, the Government has forced upon it the necessity of caring for the defective enlisted men for a longer or shorter period, in some cases for the remainder of their lives, without any return in service.

It is absolutely idle and unreasonable to believe that any man will suddenly change his immoral or pernicious habits immediately after his entry into the naval service. The only solution of the problem is to devote more time to inquiry into the past history of candidates for enlistment. Failure to do so means the acquisition by the Navy and Marine Corps of worthless recruits, who tend to demoralize the service, create scandals, become general court-martial prisoners, and candidates for insane asylums.

No. and initials.	Age. (yrs)	Rank or rate.	Enlisted.	Became insane.	Diagnosis.	Family history.	Personal history.	General observations.	Remarks.
1, A. C. Y....	16	Private, U. S. Marine Corps.	Nov. 20, 1909	June 16, 1910	Dementia præcox.	Almost negative; parents divorced; father 10 years older than mother.	Always been "nervous" and seclusive; not popular at school; has been a "dreamer" and subject to periods of depression and melancholy; enlisted to get away from enemies and because "tired of life on outside;" masturbator since 12 years old.	Has multiple stigmata of degeneracy; is very timid in manner and blushes easily; has delusions of persecution whose origin antedate enlistment; is very emotional.	Very probably insane at time of enlistment.
2, H. G.....	17	Apprentice seaman, U. S. Navy.	June 1, 1910	June 8, 1910	...do.....	Family Russian Jews; father neurasthenic.	Was 3 months recovering from diphtheria; conduct bad at school; was committed by father to reform school as "incorrigible" just prior to enlistment in Navy; enlisted to "keep out of trouble and get trip around the world."	Very emotional and irritable; takes very little interest in relatives; has typical head and face of a degenerate with multiple stigmata of degeneracy; psychopathic individual.	Do.
3, S. L. L.....	33	Private, U. S. Marine Corps.	July 31, 1909	Apr. 22, 1910	Manic-depressive insanity.	Negative, except for statement of patient that family is of "nervous temperament."	Syphilis 12 years ago; deserted wife because of infidelity; discharged from Quartermaster's Department, Army, because of "incompetency and unreliability;" masturbator when young; has persecutory delusions whose origin antedate enlistment.	Is very egotistic and has exaggerated ideas of family importance; uses much slang and has many silly mannerisms; has head and face of a degenerate.	Do.
4, F. S.....	22	Private, U. S. Marine Corps (genera court-martial prisoner).	Dec. 6, 1907	May 13, 1910	Dementia præcox.	Mother and sister "very nervous and irritable—any little thing scares them;" 5 maternal aunts and 2 cousins died of tuberculosis.	Typhoid fever at 15; sick 11 months, delirious most of time; head injury when 18, unconscious 24 hours, no operation; masturbated at 10; history of sexual excesses; deserted from Army after 30 days' service; enlisted in Marine Corps "to get treatment for rheumatism."	Has "wanderlust;" has never remained in one position long; very irritable and easily angered; skin of very fine texture and complexion very fair; has multiple stigmata of degeneracy.	Psychopathic individual.

No. and initials.	Age. (yrs)	Rank or rate.	Enlisted.	Became insane.	Diagnosis.	Family history.	Personal history.	General observations.	Remarks.
5, W. S.....	21	Private, U. S. Marine Corps.	May 9, 1909	May 17, 1910	Dementia præcox.	Mother hysterical and has frequent attacks of migraine—melancholic at times; 5 sisters have "weak eyes;" 1 brother and 1 sister "sickly."	Very "puny" when young; was several months recovering from "mumps;" was always "bashful in presence of girls;" patronizes prostitutes "regularly;" has had gonorrhea; has been involved in frequent quarrels; has always been seclusive; says he is "impulsive."	Has typical head and face of a degenerate with multiple stigmata of degeneracy; enlisted in Marine Corps "to keep out of trouble and in order to qualify as world's champion prize fighter."	Psychopathic individual.
6, T. E. C.....	22	.....do.....	Dec. 20, 1907	May 24, 1910	...do.....	Maternal grandmother died of "some nervous trouble;" father died of diabetes; "was always nervous;" mother has neuralgia and "dizzy spells;" 1 brother died of tuberculosis; 1 brother "sickly;" 1 sister "nervous;" 2 paternal cousins insane.	Had "bronchitis" for 3 or 4 years when quite young; delirious during an attack of "pneumonia," and after recovery would frequently "wander off for 3 or 4 days and not know when to come back;" chronic alcoholic since quite young, frequently drunk; masturbator; frequent sexual excesses; gonorrhea at 17; has "always been bashful and nervous;" was "backward" at school.	Is dull, stupid, and rather slovenly in appearance; is somewhat careless in his answers to questions; has flat foot and multiple stigmata of degeneracy; has never had any definite object in life and is without ambition; he is a wanderer.	Do.
7, W. L. R.....	21	.....do.....	Aug. 13, 1909	Nov. 13, 1909	...do.....	Maternal grandfather committed suicide; mother "high-strung and quick tempered;" an infant brother died of convulsions.	"Diarrhea" from second to twelfth year of age; gonorrhea at 20; made poor progress at school, was "held back" twice; enlisted in Marine Corps in order to "get trip around the world;" was very slow in learning to walk and talk as a child.	Laughs in a silly manner when answering serious questions, and attention is difficult to gain and still more difficult to keep; indifferent to, and takes very little interest in, surroundings.	Constitutionally inferior.
8, J. L. K.....	33	.....do.....	Jan. 14, 1906	Aug. 14, 1908	...do.....	Father suffered with "nervous breakdown;" father alcoholic; mother insane.	Had an attack resembling epilepsy when a child; gonorrhea when young; also "thinks" he had syphilis, not sure; is unable to give a good account of himself.	Has multiple stigmata of degeneracy; very stupid and dull; frequently smiles in a silly manner without adequate cause; nervous and somewhat constrained in manner; has far-away look.	Do.
9, J. E. R.....	21	Coal passer, U.S.Navy.	Nov. 1, 1905	Feb. 10, 1909	...do.....	A paternal cousin became insane "trying to invent perpetual	"Did not care much for school," and was frequently "bilious and	Is dull and stupid in appearance, and has multiple stigmata of degeneracy; is	Do.

						motion," and committed suicide; father is a chronic alcoholic; paternal grandfather died of apoplexy.	dopy;" made poor progress at school, 4 years getting through first and second grades; about 1 year prior to enlistment in Navy he attempted to drown himself; masturbator; chews tobacco excessively; has indulged in alcohol in doubtful moderation.	quite undeve opedf or age; is nervous and awkward; laughs in a silly manner; gives careless answers to serious questions, and eyes have a glassy stare.	
10, C. M. R....	22	.....do.....	Aug. 13, 1908	Sept. 14, 1909	...do.....	Father is a chronic alcoholic.	Had "malaria" when 19 years old; is a chronic alcoholic, and regularly "goes on a spree about once a month;" prior to enlistment in Navy was three times a patient in insane asylums; has always been regarded as "eccentric;" enlisted in Navy "for a trip around the world."	Has multiple stigmata of degeneracy, both jaws very narrow, and palate poorly formed; is without ambition, and never takes much interest in anything; reasoning is very superficial and judgment is poor.	Predisposed to insanity at time of enlistment.
11, E. M. H...	22	Ship's cook, U.S.Navy.	July 13, 1910	Sept. 24, 1910	Psychic epileptic.	Father chronic alcoholic, had delirium tremens; mother has paralysis of left leg; 1 sister hysterical; 1 sister died of tuberculosis; maternal uncle insane; an epileptic cousin shot himself.	"Nearly died of membranous croup" at 4 years; typhoid fever at 18; smallpox at 21; gonorrhea at 22; began morphine habit when 21, also tobacco; had epileptic fits between 10 and 12; has been "drunk at least 100 times, drunk sometimes 2 or 3 weeks;" poor progress at school, "played hookey" a great deal, and frequently engaged in quarrels; was patient in insane asylum 3 times prior to enlistment in Navy.	Has a fair degree of intelligence but has no ambition, no definite aim in life; has "bummed around the country" and "beat" his way on railroads for past 5 years; has a poor sense of morality; easily becomes dissatisfied with any employment, and is very irritable at times, "gets mad easily;" is very little interested in what goes on about him.	Constitutionally inferior.
12, E. R.....	24	Coal passer, U.S.Navy.	Feb. 16, 1909	Sept. 27, 1909	Dementia præcox.	Father is a chronic alcoholic; mother is "very nervous."	Gonorrhea when 19, continued 3 years; expelled from school for misconduct; frequently played "hookey"; made very poor progress at school; worked about 1 year after leaving school; then began the life of a "hobo"; is afflicted with wanderlust; life has been a career of failures; alcoholic and masturbator.	Facial expression very stupid and dull; takes very little interest in his surroundings and can not give a motive for a good many of his actions; is without ambition and admits he has always "tried to get along without working very much;" has multiple stigmata of degeneracy.	Constitutionally inferior, and typical tramp.

No. and initials.	Age. (yrs)	Rank or rate.	Enlisted.	Became insane.	Diagnosis.	Family history.	Personal history.	General observations.	Remarks.
13, S. R.....	24	Ordinary seaman, U. S. Navy.	May 8, 1906	June 8, 1907	Dementia præcox.	Father is a chronic alcoholic, mother is "very nervous."	Suffered with "ear disease" for several years when young; admits being "drunk a good many times," and having "bummed" his way on railroads for several years.	Is unable to give a good account of himself; is stupid and dull in appearance; is a masturbator; frequently laughs in silly way; answers questions carelessly.	Constitutionally inferior, and typical tramp.
14, T. B.....	28	Fireman, 2d class, U. S. Navy.	Nov. 12, 1908	Sept. 2, 1909	...do.....	Negative, as obtained from patient.	Kicked by horse when 4 years old, skull fractured, and piece of bone removed, in bed 3 weeks; excessive masturbator since young boy; gonorrhea 5 times; was 3 times a patient in an insane asylum prior to enlistment.	Has very defective intellect, but well-developed body; is childish and has perpetual silly grin on face; has no idea of responsibility and will believe almost anything told him.	High-grade imbecile.
15, F. G.....	28	Private, U. S. Marine Corps (general court-martial prisoner.)	May 9, 1907	May 24, 1910	...do.....	Maternal grandfather died of apoplexy; maternal aunt and mother are insane; 1 brother "feeble-minded;" 1 sister died of "mental melancholia;" 2 maternal uncles were considered "mentally unbalanced."	Had epileptic convulsions as a child; chronic alcoholic and masturbator since 16 years old; has been drunk many times; had "mental breakdown" at 18, worried about genito-urinary organs; dummy at school; was patient in insane asylum prior to enlistment; deserted 4 days after enlistment.	Is very timid and constrained in manner, but very circumstantial in conversation; is afflicted with wanderlust, and his life has been a career of failures.	Probably insane at time of enlistment, as origin of insane ideas antedates enlistment.
16, E. J. L....	22	Seaman, U. S. Navy.	Nov. 1, 1906	July 6, 1910	...do.....	Mother and father both alcoholic; mother died of "some nervous disease;" 1 sister very "nervous;" 1 sister died of tuberculosis; 1 sister "used to have fits at night;" 1 sister sexual pervert and "considered crazy;" a paternal uncle was "born deaf and dumb."	Head was "tapped" when 4 or 5 years old; has unusually large head; gonorrhea at 20; has been "drunk many times since 15 years old; in jail once while drunk;" had "fits" when small, usually at night, and frequently nightmare; made poor progress at school, "was kept back once in a while;" career of failures.	Sad-faced young man; memory very poor; is very stupid and dull; takes very little interest in what is going on in the world; has multiple stigmata of degeneracy, including macrocephalic skull; gives history of sexual excesses; is over credulous.	Congenitally defective individual.
17, F. C. W...	23	Shipwright, U. S. Navy.	Jan. 9, 1908	July 26, 1909	Manic-depressive insanity.	Father committed suicide and was "mentally unsettled;" sister died of "spinal	"Never cared much for education," and made poor progress at school; has worked at "many differ-	Is morbidly shy and introspective; is fond of using high-sounding phrases, but mispronounces some of his	Constitutionally defective individual.

						meningitis;" maternal aunt and daughter "considered peculiar;" "the whole family are nervous and irritable."	ent jobs and changed employers often;" has frequently been engaged in quarrels.	misapplied words; is a dreamer and claims to have inventive ideas; admits several times having contemplated suicide.	
18, E. J. R....	21	Apprentice seaman, U. S. Navy.	Aug. 17, 1909	Sept. 8, 1909	Dementia præcox.	2 aunts "suffered with nervous trouble;" father "very nervous some times."	Was "always shy" and liked to be by himself; quit farm life because he "was tired of getting up early in the morning;" gets "tired" very easily; enlisted in Navy because he "could not find anything else to do."	Is stupid and dull; emotionally indifferent; cerebration very slow; makes silly remarks at times and then laughs at them; is indifferent to surroundings and has dull facial expression.	Constitutionally inferior.
19, T. A. C...	25	Boiler-maker, U. S. Navy.	Sept. 14, 1908	Mar. 13, 1909	...do.....	Father died of "some lung trouble;" 1 brother uses alcohol to excess.	"Tended bar" for 7 months in Brooklyn, and has used alcohol to excess since 18 years old; has had gonorrhea.	Is unable to give a good account of himself; memory poor as to work done before enlistment; has no ambition and is noncommittal; is dull and does not take a proper interest in surroundings.	Psychopathic individual.
20, W. T. B..	21	Private, U. S. Marine Corps.	Feb. 26, 1907	Mar. 1, 1907	...do.....	Father alcoholic; 1 sister died of "dropsy" when 8 years old; mother had children by 3 husbands, and patient is second husband's child.	Typhoid fever at 8; has been on several alcoholic "sprees;" has masturbated since an early age; has had gonorrhea; has always "tired" very easily at any work, and was once discharged for inefficiency; admits bestiality on several occasions; also sodomy; has "bummed" his way on railroads "several times for fun."	Is a sexual pervert and simple-minded; has vacant facial expression and stupid manner; frequently laughs in silly manner without cause; is nervous and timid; has multiple stigmata of degeneracy.	Insane at time of enlistment.
21, C. O. C....	30	Coal passer, U.S.Navy.	Dec. 11, 1907	Jan. 29, 1908	Imbecility	Father "queer" for several years and probably insane; also chronic alcoholic; paternal uncle died insane; mother suffered greatly with indigestion, and "worried a great deal."	Was always considered a "dummy," and very delicate as a child; did not get on well at school; "was lovesick most of the time," and "was kept back once;" left school once because he got into trouble on account of theft; has masturbated and committed acts of bestiality since 14; has been discharged many times from employment; career of failures.	Is not frank, is emotionally indifferent, and has a very awkward manner; is very feeble-minded, and will believe almost anything told him; has multiple stigmata of degeneracy; is very easily irritated and admits being frequently involved in quarrels; has never found work which suited him.	Imbecile when enlisted.

No. and initials.	Age. (yrs)	Rank or rate.	Enlisted.	Became insane.	Diagnosis.	Family history.	Personal history.	General observations.	Remarks.
22, F. W.....	25	Ordinary seaman, U. S. Navy.	Nov. 16, 1908	May 11, 1910	Dementia præcox.	Nothing known by patient about parents and ancestry, as he spent early years in an orphanage, and has never been told about his parents.	Made poor progress at school and "played hookey" a great deal; did not care for school; early became afflicted with wanderlust; discharged several times from employment; has been arrested for theft; twice in reform school prior to enlistment; has beat his way on railroads several times.	Is nervous in manner, and seldom looks one squarely in the face when talking; has great credulity, and will believe almost anything told him; admits having several times contemplated suicide; has microcephalic skull.	Constitutionally inferior.
23, F. V. H...	32	Fireman, U. S. Navy (general court-martial prisoner).	Aug. 25, 1906	While a deserter.	...do.....	Paternal grandmother was insane; father is a chronic alcoholic; mother has chronic headaches and "neuralgia;" 3 uncles are chronic alcoholics.	Has indulged excessively in the use of alcohol since 15 years old, spends all his money for whisky, and been drunk many times; tried opium pipe once; has had a career of failures; been discharged many times; has contemplated suicide.	Has a rather vacant facial expression, and is unable to give a good account of himself; reasoning and judgment are very shallow; is seclusive and does not take a proper degree of interest in his surroundings.	Psychopathic individual.
24, H. A. F...	21	Apprentice seaman, U.S.Navy.	Aug. 29, 1910	Aug. 30, 1910	...do.....	Maternal grandmother died insane; both father and mother alcoholic; mother died of cirrhosis of liver.	Masturbator; alcoholic—has frequently been drunk; made very poor progress at school, never cared for school; enlisted in Navy to get "trip around the world."	Very dull and stupid; memory poor, and is unable to give a good account of himself; microcephalic skull; thought very shallow; undeveloped for age; childish.	Congenitally defective; insane when enlisted.
25, A. S.....	23	Coal passer, U.S.Navy (colored).	Mar. 10, 1908	Sept., 1909	...do.....	Father acoholic; mother has had chronic headaches for several years.	Typhoid fever and pneumonia at 19; sick 2 months; delirious most of time; gonorrhea at 13; masturbator since 15; ran away from home when 13; enlisted in Navy "to see the world."	Memory poor; can not give a good account of himself; stupid; voice very low and indistinct; reasoning defective; has difficulty in grasping meaning of questions; emotionally indifferent; forehead low; skull microcephalic; neck short and thick.	Constitutionally inferior.
26, P. T. B...	29	S. F., 2d class, U. S. Navy.	June 25, 1909	Oct. 29, 1909	Manic-depressive insanity.	Negative; patient is of Irish parentage.	Masturbator; gonorrhea at 23; "has always been nervous."	Patient is an accomplished liar, and not much reliance can be put in statements; constrained in manner; emotional; memory poor; not frank.	Psychopathic individual.

27, C. L.....	18	Seaman, U. S. Navy (general court-martial prisoner).	Nov. 7, 1905	Dec. 11, 1909	Dementia præcox.	Maternal grandfather is "unbalanced" (mentally); paternal grandfather alcoholic; father alcoholic and died of tuberculosis, was once in reform school as inmate; 1 maternal aunt insane; 1 maternal aunt has "some nervous trouble."	Was "weak in the back" as child, and had "crops of boils" every year for 10 years; "was sickly" in infancy and childhood; masturbation since 14; alcoholic, has been drunk many times; failed to keep up with his class twice at school; as a boy, used to have "sinking spells," and mother would find him trying to climb up walls of his room at night; somnambulist.	Undeveloped for age; simple minded; vacant facial expression; emotionally indifferent; has no interest in world at large; has delusions concerning people and facts whose origin antedates enlistment; admits having contemplated suicide; judgment poor; enlisted in Navy because "tired of doing nothing."	Probably insane at time of enlistment.
28, N. B.....	18	Ordinary seaman, U.S.Navy.	Aug. 2, 1909	May, 1910	...do.....	Negative as given by patient.	"Very mischievous at school;" did not care for school; left school to sell papers against father's wish; had never been 20 miles from home prior to enlistment; lied about age when he enlisted.	Very credulous; undeveloped for age; genital organs are relatively too large; nervous in manner and shifts about uneasily in chair; is easily embarrassed, and seldom looks one squarely in the face while talking; poor memory.	Constitutionally inferior.
29, C. C.....	30	Private, U. S. Marine Corps.	July 8, 1909	Aug. 23, 1909	...do.....	A maternal cousin is insane; a sister has never been strong.	When 8 years old fell on his head and was unconscious for 5 days; gonorrhea 3 times prior to enlistment; sexual excesses at irregular intervals; masturbation at 13; drunk on alcoholic liquors "about 20 times in his life;" life a career of failures; has lost health, money, and ambition as speculator and "plunger" in stock market; enlisted in Marine Corps because could not find anything else to do "and just to to change his luck."	Uses a good many high-sounding words and phrases, the meaning of which he is ignorant; mispronounces a good many words; has complacent air; muscles of mouth frequently twitch involuntarily; has multiple stigmata of degeneracy, including low forehead; frequently laughs in silly manner without cause; gait is slouchy.	Psychopathic individual.
30, J. B.....	21	Electrician, 3d class, U.S.Navy.	Apr. 1, 1908	Oct., 1910	Manic-depressive insanity.	Mother hysterical and probably of a psychopathic make-up, has chronic headaches; "entire family musical and artistic."	Weighed 14½ pounds when born; has always been "erratic;" masturbator since 12; never cared for books and "was always playing pranks at school;" says he has always been "impulsive and does things without thinking."	Is very talkative and boastful; has exaggerated ideas of his abilities and importance; has low sense of morality; skull macrocephalic in type; has mitral systolic murmur.	Do.

No. and initials.	Age. (yrs)	Rank or rate.	Enlisted.	Became insane.	Diagnosis.	Family history.	Personal history.	General observations.	Remarks.
31, E. E. V...	18	Seaman, U. S. Navy.	Oct. 29, 1907	June 22, 1909	Dementia præcox.	Mother died of cancer; father has "always had poor eyesight."	Was expelled from public school "for bad behavior;" used to tear up his and others' schoolbooks; very backward at school; has frequently been drunk; enlisted in Navy against advice of father "to make man of himself and get trip around the world."	Is very childish in appearance and undeveloped for years; quite simple minded; lacks determination and will power; superficial thinker; lied about age when enlisted; is quite ignorant, and writing and spelling are very poor, though he claims to have gone through common school; is irresponsible.	Psychopathic individual.
32, E. J. T....	22	Private, U. S. Marine Corps.	Sept. 7, 1909	Sept. 28, 1910	.....do.....	Mother is "very excitable and has nervous disposition;" a paternal aunt and a brother died of tuberculosis.	When a child was sick all one winter from mumps; suspicious history of tuberculosis at 14; masturbation since quite young; also sexual excesses; excessive alcoholism; attempted suicide when 18; was 3 times a patient in insane asylum prior to enlistment, and was such a patient when enlisted; was "always erratic."	Boastful and untruthful; memory of school knowledge poor; has defective moral sense; has had many jobs, and admits easily becoming dissatisfied with any work; chiefly interested in pet animals, and says he "always has a little menagerie" with him.	Potentially insane when enlisted.
33, W. H. B..	19	.....do.....	Sept. 24, 1908	Feb. 17, 1910	.....do.....	Negative as given by patient.	Masturbator; has indulged in excessive use of alcoholic liquor since 19, drunk "a good many times;" discharged for inefficiency from only 2 jobs he ever had prior to enlistment, and was idle about 1 year; enlisted because "couldn't find anything else to do; never cared for school."	Emotionally indifferent, stupid and dull; poor memory; takes little or no interest in his family; knows very little about them; unable to give good account of himself; has "simian face" (resembling monkey).	Constitutionally inferior.
34, A. H. K...	19	Coal passer. U.S. Navy.	Sept. 18, 1909	May —, 1910	.....do.....	Mother is of a "nervous disposition," probably hysterical; sister is "irritable;" a paternal uncle is insane; a paternal cousin is "not considered right" (mentally).	Severe attack of "grippe" at 10; masturbator since early age; was "backward at school," and was "held back one year;" discharged twice from work because of getting into fights with other workmen; easily dissatisfied with work, and tires	Very dull and stupid; is restless and afflicted with wanderlust, is an embryonic "hobo;" memory is poor; cerebration very slow; has vacant facial expression; skull is of macrocephalic type; enlisted in Navy because he "couldn't find anything	Do.

							easily; has "loafed a good deal," and beat his way on railroads "for about 1,000 miles."	else to do, and wanted to see the world."	
35, J. McC....	22	Private, U. S. Marine Corps.	Apr. 10, 1907	Nov. 3, 1907	.....do.....	Negative as given by patient.	Made poor progress at school; prior to enlistment lived "a hand-to-mouth existence;" has indulged in use of alcoholic liquors in doubtful moderation, though he will not admit ever being drunk; tires easily, and has twice left employment without notice.	Is unable to give a good account of himself; memory poor; shabby personal appearance; manner is childish, and he frequently laughs in silly way without cause; credulous and gullible; attention difficult to gain and hold; defective mentality.	Do.
36, B. S.....	21	Apprentice seaman, U. S. Navy.	Nov. 27, 1909	Sept. 10, 1910	.....do.....	Paternal grandfather alcoholic; father indulged in excessive use of alcohol, and had "leg ulcers for 40 years;" mother not very strong.	Had chronic cough for several years until 12 years old; has indulged in excessive use of alcohol since 13; once arrested for "disorderly conduct" while drunk; "was not considered bright" at school, and never cared for school; easily becomes tired, and does not care much about work; enlisted in Navy "to see the world and have a good time."	Has a well-defined speech defect, and "lisps;" has typical face of a degenerate; simple minded, and his thought very shallow; quite ignorant and is without ambition; is irresponsible; has multiple stigmata of degeneracy; is afflicted with wanderlust, and is probably an embryonic "hobo."	Congenitally deficient mental makeup.
37, E. J. C....	21	Seaman, U. S. Navy.	Nov. 9, 1907	Apr. 7, 1910	.....do.....	Father is a chronic alcoholic and is probably insane, though not committed to a hospital; mother has vertigo; a paternal uncle died of tuberculosis; a maternal cousin is insane.	Has had pneumonia twice; also gonorrhœa and chancroid; had "severe acne" when 18, continued 3 years; despondent at this time and contemplated suicide; masturbator since early age; excessive alcoholism since 18, drunk many times; very backward at school, "held back several times;" difficult to find satisfactory job.	Has multiple stigmata of degeneracy, including hypospadias; manner is awkward and nervous; is morbidly timid, and says he has "always been bashful;" is unable to look one full in the face for more than a few seconds; has sad facial expression; says skin has "always itched."	Typical degenerate.
38, J. F. S....	38	Ship's cook, U.S. Navy.	Apr. 13, 1909	May 29, 1910	.....do....	Father died of apoplexy, and was chronic alcoholic for many years; mother died of "quick consumption and liver complaint."	Has indulged in excessive use of alcohol for several years, drunk many times; has had gonorrhœa and chancroid; masturbator since 13; father has frequently told him "not to look so silly and keep the broad grin off his face;" easily dissatisfied and has held many jobs.	Untruthful and has defective moral sense; has delusions whose origin antedated enlistment; reasoning is defective; thought shallow; is afflicted with wanderlust.	Probably insane when enlisted.

No. and initials.	Age. (yrs)	Rank or rate.	Enlisted.	Became insane.	Diagnosis.	Family history.	Personal history.	General observations.	Remarks.
39, A. S.....	24	Private, U. S. Marine Corps.	Dec. 27, 1909	June 14, 1910	Dementia præcox.	Negative, as given by patient.	Has indulged in the excessive use of alcohol for several years; drunk many times.	Is unable to give good account of himself; is very ignorant; is very timid and frequently winks his eyes without cause; memory very poor, cerebration slow; has multiple stigmata of degeneracy.	Congenital weakling and degenerate.
40, J. Z.....	24	.....do.....	Oct. 25, 1907	Mar., 1910	.....do....	Father is a chronic alcoholic; mother died of tuberculosis.	Masturbator since 22 years old; has indulged in excessive use of alcohol since 17; has always led a nomadic existence; claims common-school education, but is very ignorant.	Frequently laughs in silly manner without cause; stupid and dull of comprehension; becomes easily confused while talking somewhat emotional; becomes familiar on short acquaintance.	Constitutionally inferior.
41, J. McG....	21	.....do.....	Dec. 31, 1909	Oct. 19, 1910	.....do....	Mother died of tuberculosis; father "moderate" (?) user of alcoholic liquors.	"Malaria" at 12, sick 4 months; delirious a portion of time; masturbated when 13; sexual excesses since; "drunk many times" since 18; expelled twice from school for misconduct; has lived a nomadic life since leaving school; has beat his way on railroads for over 10,000 miles.	Untruthful and boastful; Gives careless answers to questions; says father used used to whip him a great deal for lying; easily tires at any work; enlisted in Marine Corps "to get an easy job."	Typical hobo.
42, C. J.....	22	Apprentice seaman, U.S. Navy.	Dec. 9, 1909	Sept. 10, 1910	.....do....	Mother died of "cancer of the stomach;" father "moderate" (?) user of alcoholic liquors.	Malaria when 20; delirious a portion of time; gonorrhœa when 15, sick 3 or 4 years; had arthritis of both ankles; syphilis when 18; masturbator since 14; Excessive alcoholism since 17; failed of promotion several times at school; nomadic life since; has "bummed" his way on railroads for over 12,000 miles.	Not well developed for his age; thought shallow, memory poor; answers questions carelessly; has had many jobs, but never suited; enlisted in Navy "to get some queer ideas out of his head;" takes very little interest in what goes on about him.	Do.
43, C. W. K...	32	Coal passer, U. S. Navy.	Sept. 14, 1909	Sept. 28, 1909	Manic-depressive insanity.	Mother died of cancer of the stomach; a brother died in infancy of "brain fever."	High-school education; since leaving school has been afflicted with wanderlust; says he has "roving disposition," and has "bummed" his way on	Conversation is filled with slang phrases characteristic of the vagrant class; married, but takes little or no interest in family; has quite defective moral	Do.

							railroads for over 6,000 miles; lost his money in stock speculation and attempted suicide; committed to insane asylum; upon discharge from asylum enlisted in Army; soon court martialed for desertion and discharged from Army "without honor."	sense; untruthful; has no ambition; has the appearance of a prematurely old man, hair quite gray; has no regard for personal appearance.	
44, J. M.....	24	Landsman, U. S. Navy.	July 24, 1908	Aug. 2, 1910	Dementia præcox.	Father is a chronic alcoholic, drunk many times; mother is a steady drinker of alcoholic liquors, but patient has never seen her drunk; she frequently has "fits of temper and is hard to get along with."	Pneumonia when 16; excessive alcoholism since 18, drunk many times; has twice been arrested and locked up in jail while drunk; left several jobs because "the work was too hard;" once discharged because of "lack of work;" enlisted in Navy "to see what it was like."	Is unable to give a good account of himself; memory poor; shabby and dirty in personal appearance; wears a vacant smile on face; indifferent to surroundings; seldom looks one squarely in the face; cerebration slow.	Constitutionally inferior.
45, C. B. M....	26	Coal passer, U. S. Navy.	July 13, 1910	Aug. 25, 1910	.....do.....	Paternal grandfather was chronic alcoholic; father chronic alcoholic; also brother and cousin; one sister "gets a little off" (mentally) about every 6 months; one uncle is a "ne'er-do-well;" mother died of tuberculosis.	Excessive masturbation since 15; "ptomaine poisoned" when 23, sick 4 weeks; unconscious 1 week; quarrelsome at school; head injury 3 years ago; spent 6 months as patient in insane asylum 2 years ago; complains of spot painful to pressure in right fronto-temporal region.	Very silly in both appearance and manner; boastful and complacent; has delusions which originated prior to enlistment; reasoning and judgment are poor; gives history of being meddlesome and quarrelsome and not minding his own affairs; memory poor.	Insane at time of enlistment.
46, F. F. C....	18	.....do.....	May 12, 1910	Sept. 30, 1910	.....do....	Paternal grandfather died of paralysis; father chronic alcoholic, died of "heart failure;" mother "nervous" and chronic alcoholic; 1 sister "coughs a great deal and looks sickly;" 3 maternal aunts insane; 1 paternal uncle "queer" (mentally).	Has smoked cigarettes to great excess for several years; had "fits and nervous spells" as a child; has had chronic cough since 9 years old; masturbator since 12; excessive alcoholism since 14; quarrelsome at school and "played hookey a great deal;" gets "tired very easily."	Somewhat bright in appearance, but nervous in manner; memory is very poor; has never held one job very long; was once discharged for drunkenness; is quite timid.	Psychopathic character.

No. and initials.	Age. (yrs)	Rank or rate.	Enlisted.	Became insane.	Diagnosis.	Family history.	Personal history.	General observations.	Remarks.
47, G. E. A....	26	Private, U. S. Marine Corps.	July 16, 1907	Mar. 29, 1909	Dementia præcox.	Maternal grandfather died of "some spinal trouble;" mother had epilepsy; "1 sister is weak and has headaches."	Was "ruptured" when a boy and wore a truss for 6 years; kicked on head by horse when 4 years old; was in hospital, but don't know how long; made poor progress at school and was not considered bright; been "drunk a good many times."	Quite stupid and dull; voice is very low; is moody and seems indifferent to surroundings; cerebration very slow; memory poor; skull is somewhat macrocephalic; simple minded.	Constitutionally inferior.
48, J. P. B....	21	.....do.....	June 12, 1909	June 16, 1909	.....do....	Father died of "Bright's disease;" mother "very nervous;" 2 sisters "very nervous like mother;" a brother died of "pulmonary hemorrhage;" alcoholism is prevalent in father's family.	"Very puny and delicate as a child, and was not considered bright;" "used to go off in a dream and would see monsters coming after him at night;" was refused for enlistment by both Army and Navy, but was accepted by Marine Corps; enlisted "because tired of doing nothing."	Has delusions and hallucinations which originated prior to enlistment; emotionally indifferent; is unable to give a good account of himself; frequently laughs in silly manner without cause; simple minded.	Insane at time of enlistment.
49, H. H.....	26	Coal passer, U. S. Navy.	Sept. 6, 1907	Dec. 27, 1907	.....do....	Mother died of tuberculosis; father was a chronic alcoholic; a sister died of tuberculosis.	Gonorrhœa when 24; has indulged excessively in alcohol, also opium; has masturbated since an early age; gives a history of wanderlust and tramp life; made poor progress at school.	Somewhat intelligent in appearance, but has a shifty, hangdog look; is an accomplished liar, and has defective moral sense; gives careless answers to questions.	Constitutionally inferior and professional hobo.
50, P. E.....	29	.....do.....	July 25, 1910	Sept. 15, 1910	Imbecility	Father chronic alcoholic; cause of death of mother is unknown; has had two step-mothers; was poorly bred and born.	Very unhappy childhood; has been inmate of orphans' home, reform school, and penitentiary; gives vague history of heat prostration; claims high school education, but can not multiply 7 by 6; has beat his way on railroads and steamships for thousands of miles; is afflicted with wanderlust, and has never worked 6 months for any one man.	Is quite simple minded, and thought very shallow; is very irritable and excitable, always wants to have his own way in doing things; becomes angry very easily; is very credulous; admits habits of masturbation and sexual perversion; he stutters; gives careless and contradictory answers to questions.	Do.

DIAGNOSIS AND TREATMENT OF HERNIA IN THE NAVY.

By Passed Asst. Surg. B. F. JENNESS, United States Navy.

Hernia in our service is largely confined anatomically to a single type—oblique inguinal.

The annual report of the Surgeon General for 1909 records 240 cases operated for inguinal hernia, and, with the single exception of circumcision, this number exceeds that of operations for any other condition.

The large percentage of oblique hernia among enlisted men, compared with other forms of hernia and against the percentages in civil hospitals for this variety of hernia, makes an interesting study, not only of hernia in general, but of the enlisted man as anatomically predisposed to this peculiar type of hernia.

Of course, the age, sex, and occupation of the seaman predispose to oblique hernia, and the same factors favor early operation.

Oblique hernia is a hernia most frequently found in young males. Keen estimates that 93 per cent of all inguinal hernias are of the oblique type, and his direct hernias were almost all in adults.

These factors explain the frequency of oblique hernia in recruits, but why are direct and ventral hernias not seen in the adult life of our enlisted men?

Over half of our men reenlist. They are engaged in practically every occupation requiring physical exertion found in civil life.

They undergo every kind of physical strain and live in every climate, yet the inguinal canal continues to be the vulnerable point, and oblique inguinal hernia is the type causing invalidism alike among recruits and continuous-service men.

Brenner, in 1,188 cases of hernia in the male, found 9 per cent to be of the direct variety. Keen, in 1,980 operations, found 2 per cent direct.

Keen states that femoral hernia seldom appears before puberty, and further states the proportion of femoral to inguinal hernia as 1 to 17. This proportion was observed at the Hospital for Ruptured and Crippled, and the same was seen by Macready at the London Truss Society.

These statistics are quoted to show that forms of hernia other than oblique inguinal are not so rare as is ordinarily considered, and to bring to mind the extreme rarity of these other forms of hernia in a class of men who are living a more active life than those from which statistics are drawn in civil life.

Hernia in the Navy, then, means practically oblique inguinal, uncomplicated by the inguino-interstitial or inguino-perineal type. The hernia of the recruit is usually incomplete, scrotal hernia being seen, as a rule, only in men of two or more enlistments—i. e., in more

mature men who have been subjected to frequent strains extending over a long period of time.

At whatever age the enlisted men of our service come to operation for hernia it is usually for the relief of the same type—oblique inguinal—and it is believed that the reason for this extreme prevalence of one form of hernia, like the reason for many other prevailing pathological conditions and diseases in the service, lies in the "prior to enlistment" life of our recruits.

The inguinal rings of our newly enlisted men are often relaxed. The normal external ring admits only the tip of the index finger, and consequently we should not be able to palpate the internal ring. Yet what a vast number of recruits at our training stations are passed with rings which would admit the finger of the examiner to the entire inguinal canal.

Under service conditions but a short time is required for a bulging of the transversalis fascia in these cases to become a bubonocele, and the bubonocele a complete hernia.

Owing to the number of physical examinations preliminary to transfer, etc., to which the enlisted man is subjected, these cases come to operation early, and the incomplete hernia never receives the necessary strain required to convert it into a complete one.

But suppose our recruits enter active service without a hernia, serve one or two enlistments, and then report with oblique hernia.

In the opinion of the writer there are two reasons why even a small percentage of such men do not present direct, ventral, or femoral rather than oblique inguinal hernia.

First. Our recruits almost invariably have weak abdominal walls. This weakness may consist of an actual underdevelopment of the internal and external oblique muscles, or a congenital gaping of the inguinal canal until the shelving edge of the internal oblique in the lower part of the canal no longer gives support, and the canal becomes a great triangle of transversalis fascia and peritoneum, into which the cord sags.

Under these conditions there is no anatomic reason for the development of a direct hernia, even in later life.

The fascia of the entire canal can bulge into the canal, the intestine follows the way of least resistance, and, underdeveloped though the muscular wall may be, it offers more resistance than the fascial floor of the canal, and indirect hernia results.

This weakness of the abdominal wall has been observed particularly in the operating room.

The writer has frequently found the internal oblique muscle so thin and relaxed that sutures were passed through the edge of the rectus and its sheath and thence through the internal oblique, resulting in a puckering or contracting of that muscle, to insure a holding

ground for the sutures until union of the muscle and Poupart's ligament could occur.

The cremaster, when sufficiently developed, is utilized to assist in forming a floor for the canal, but with these aids it is not infrequently a question whether the thin, ill-nourished muscle will serve as a canal floor.

The rectus is usually well developed, as are other skeletal muscles, but the recruit in our Navy is sadly in need of an abdominal wall as a vital part of his general muscular outfit.

It seems to the writer that the reason for this weakness of abdominal muscles can be traced to the previous life of the recruit, which has not been an active one from a standpoint of muscular exertion.

The boys presenting themselves for enlistment have, as a rule, led one of two kinds of boyhood life—either that of a student or of an idler [?].

A few come from the farms, the majority from the cities, and if they have performed labor of any kind it has been of a specialized type in some factory or mercantile establishment.

The second reason for the absence of the rarer forms of hernia in the service is the fact that our recruits, having entered the service with a generally weak and relaxed abdominal wall, with or without large inguinal rings, are not given the opportunity to develop the abdominal muscles, and therefore they retain their original supply of muscle until adult life.

When severe strains occur which would perhaps produce direct or ventral hernia in a strong wall they do not do so in these cases because of the thinness and flaccidity of the obliques, and the fact that in most cases the inguinal canals are wide open, offer no resistance, and gradually bulge and sag until an oblique hernia is produced.

The marching, drilling, and running done at the training stations do not develop the muscles of the abdomen, for the erect posture is kept in each of these exercises and strain is not brought upon the muscles of the abdomen.

The swimming, rowing, and "setting up" drills are excellent developers, but time does not permit enough of these exercises to be taken in order to develop a strong abdominal wall.

If an applicant for gymnasium work presents himself, the instructor in civil life gives him a careful examination, measuring every part, and immediately outlines a course of instruction which, if followed, will develop the weaker parts of the muscular system of the applicant. So with our recruits, efforts should be made to develop their weak points by making gymnasium work compulsory instead of optional and by establishing a system of exercises directed particularly toward development of the muscles of the abdomen.

The weak abdominal walls of our seamen are a cause of much invaliding to hospitals and from the service.

It is believed that two remedies are available, which if properly applied would reduce the percentage of hernia and raise the physical standard of American seamen: (1) Reject all applicants whose inguinal rings are patulous to the extent of admitting a finger into the internal ring; (2) establish a system of physical training directed toward the development of strong abdominal walls in our recruits.

Having considered anatomically the causes of hernia in the enlisted man, it seems desirable to speak of hernia from a clinical standpoint.

The radical cure of hernia is an operation familiar to the medical officers of the service, and it is not the purpose of this article to take up the technique of methods, but rather to mention some incidents and accidents of a few cases, and to speak of anatomic abnormalities met by the writer in the operating room and in the anatomical laboratory, with a hope that such mention may be of benefit to those doing hernia work in the service.

DIAGNOSIS.

There is room for more care in diagnosis of bubonocele by medical officers in the service.

Cases are seen, but not carefully palpated, and passed as buboes. The writer operated upon an encysted hydrocele of the cord not long ago upon which a diagnosis of hernia had been made.

The hydrocele sac was sausage shaped and occupied a considerable portion of the inguinal canal. The sac was thickened and the infundibuliform fascia was correspondingly hypertrophied.

Cases of relaxed rings, weak and spreading canals, appear in our hospitals with diagnosis of hernia.

In these cases the finger frequently can be passed through the entire length of the canal and into the internal ring, or rather into the abdomen, as a ring is usually not present.

The impulse on coughing is at the internal ring, not in the canal. In these cases there is no sac; therefore no hernia.

It seems reasonable and desirable that there should be a term of diagnosis for these cases in Form K, indicating a weak abdominal wall which needs repairing to prevent hernia rather than that they should go on record as hernia cases.

A case sent in as femoral hernia was operated upon in the naval hospital, Puget Sound. The sac was found protruding through a split in Poupart's ligament. It was a direct inguinal hernia which had broken through the ligament after entering the canal.

The impulse was above Poupart's ligament in the canal. The coverings of the hernial sac were skin, superficial fascia, and fascia lata. The sac contained omentum. The sac was disposed of by applying a purse string.

One case operated upon for double hernia came in with diagnosis of right inguinal hernia.

One case recently seen, and operated on for relaxed canal of both sides, was admitted with a diagnosis of bilateral hernia. In this case there were no sacs, and only repair of the canals was necessary. There was a general bulging of the canal floor on either side, but there was no impulse in the canal proper.

THE SAC.

The sac is usually found as a narrow infundibuliform process extending about halfway down the canal; frequently, however, it extends to or beyond the external ring, but does not communicate with the tunica vaginalis testis.

The diagnosis of congenital hernia is extremely difficult. Dr. R. Hamilton Russell, of Melbourne, has gone so far as to maintain that all inguinal and femoral hernias are congenital.

It is reasonable to suppose that the long sacs mentioned did at some time communicate with the tunicæ but were obliterated, and the cases are therefore congenital herniæ.

In dealing with these long sacs the writer opens the sac about midway in the canal, and, after becoming assured that the distal portion does not contain viscera or omentum, the sac is ligated and the distal portion is left *in situ*.

The proximal portion is then freed by dissection to the internal ring and dealt with as usual. This method of disposal of the portion of sac accompanying the cord down to the external ring reduces the amount of traumatism to which the cord is subjected and shortens the operation.

The hourglass sac has been encountered by the writer several times, and each time has given difficulty in dissection. In opening the sac care must be taken that the contents, which may be adherent at the point of constriction, are not injured.

Short sacs are troublesome, especially if they are thin and easily torn. In two cases the writer has been obliged to dispose of the sac by a purse-string suture, instead of the usual transfixion and ligation. Because when slitting the sac in order to reach and tie off adherent omentum, the incision was carried so far that sufficient sac could not be recovered to transfix and ligate.

In a recent operation for radical cure of a double hernia the sacs were short but very much thickened. Each sac contained a knuckle of the small intestine (without omentum) which was adherent to the sac nearly down to the internal ring. The adhesions were firm and required ligation.

Both sacs had to be slit to reach the adhesions. On one side the writer was able to recover and ligate the sac, but the other was disposed of by a purse string of strong chromic gut.

ARTERIES AND VEINS.

If the anatomic relations of the inguinal canal are normal, and the pathologic relations of the hernia are normal, the operation is a simple one, but the encountering of abnormal arteries and nerves, and puzzling conditions of sac and cord, render hernia work more interesting, but difficult.

Two veins are fairly constant in their course across the area incised for the Bassini operation.

They are the superficial internal circumflex, tributary to the internal saphenous, about midway in the incision, and a cutaneous vein joining the superficial external pudic crossing the lower angle of the wound. These veins are often of considerable size, and should be clamped on either side as soon as they present, and cut between the clamps.

In slitting the aponeurosis of the external oblique the ilioinguinal nerve is endangered. This nerve pierces the internal oblique below the level of the crest of the ilium and runs with the cord. The size of the ilio-inguinal nerve is in inverse proportion to that of the ilio-hypogastric. Sometimes the ilio-inguinal nerve ends by joining the ilio-hypogastric, or is absent.

On the other hand, should the iliohypogastric be small, for this nerve is inversely proportionate in size to the last dorsal, the ilio-inguinal will be a large and important nerve.

To avoid injuring this and other structures of the cord, the writer has designed dissecting scissors, which consist of angled scissors with tapering steel dissectors on the lower blades. This instrument can be pushed beneath the aponeurosis, and that structure may be slit without injury to underlying structures.

The veins of the pampiniform plexus may be wounded in handling the cord. The danger lies not in wounding these veins, for they can be tied, but in neglecting to tie them, in which case severe hemorrhage may follow the operation, owing to failure of the loose tissues of the canal to compress the vessels sufficiently to stop oozing.

In raising the cord from its fascial bed it should not be forgotten that the deep epigastric artery, which runs beneath the inner side of the canal, separated from the cord only by the transversalis fascia, sometimes gives off an accessory cremasteric branch which pierces the fascia about midway in the canal and joins the cremasteric artery. This branch when present is only a fraction of an inch in length, comes off from the [deep] epigastric and joins the cremasteric at nearly a right angle. This vessel and its accompanying vein are easily torn in raising the cord to place the deep sutures uniting the internal oblique and Poupart's ligament.

Two such cases have been encountered by the writer during the past year. In one case the vein was torn at its junction with the epigastric vein, and a mass ligature, including the tributary and the fascia of the epigastric vein, was necessary to control the hemorrhage.

In placing the deep sutures uniting the internal oblique and Poupart's ligament, it must be remembered that the deep circumflex iliac and accompanying veins cross Poupart's ligament at about the point where the first deep suture is placed below the cord.

The writer saw this artery punctured by the needle in one case and, owing to the dense structure of Poupart's ligament, much difficulty was found in controlling the hemorrhage which followed.

REPAIR OF THE CANAL.

Ferguson gives 6 per cent of recurrences in 165 cases following the Bassini operation, and says that in every case the hernia recurred in the upper angle of the wound.

Keen advises placing a suture above the cord as a safeguard against recurrence.

In the opinion of the writer, the Coley suture above the cord and the last suture below the cord, placed in the conjoined tendon as low as possible, are the most important deep sutures in the Bassini operation.

U. S. NAVAL MEDICAL SCHOOL LABORATORIES.

DAVAINEA MADAGASCARIENSIS IN THE PHILIPPINE ISLANDS.[1]

By Passed Asst. Surg. PHILIP E. GARRISON, United States Navy.

The report of a case of infection with a tapeworm of which the literature presents but six previous findings representing only nine infections, and of which there have been no cases reported for over 14 years, is of more or less interest to medical men in general and may be of special interest to the medical officers of the Navy whose duties take them to localities where these infections have been found or may be found in the future if the possibility of their presence is recognized. *Davainea madagascariensis* should be of special interest to medical officers of the Navy for the further reason that, as will be seen below, this species has as yet been found only in maritime surroundings, such as ships and docks.

The worms studied in the present paper were received from Dr. Vernon L. Andrews, of the bureau of science, Manila, who collected them at autopsy from the small intestine of an adult, male Filipino, at the morgue in Manila. They were entered in the Helminthological collection of the bureau of science, specimen No. 305.

HISTORY OF THE SPECIES.

In 1867 Dr. Grenet obtained the first specimen from an 18-months-old male child, at Mayotte, Comoro Islands, who had landed 5 months before from the Antilles. Later he secured a second specimen from a 2-year-old girl, native of Reunion Island, who had been in Mayotte only 2 months. From the first case only about 15 isolated terminal segments of the worm were secured. The second specimen consisted apparently of a fairly complete strobila, but was without a head. These specimens were sent to the Directeur des Archives de Medécine and forwarded to Davaine, who, in 1869, described and figured the worms and proposed a new species which he called *Tænia madagascariensis*. These specimens were later deposited in the collection of Blanchard's laboratory as Nos. 108 and 109, Davaine collection.

In 1873 a second finding of the species was made at the small island of Nosse-Be, just off the northwest coast of Madagascar. This finding was not published until 1899, when Blanchard found the specimen in the parasite collection of the faculty of medicine of Paris (Davaine collection, No. 33), bearing the label "Nosse-Be, November, 1873, passed by a little girl of 3 years." This specimen was very incomplete, being only 32 millimeters long, but it possessed the head, and Blanchard's paper, in 1899, gave the first description and the only published drawing of the head of this species.

In April, 1891, Dr. P. Chevreau announced the finding of four cases of infection with *D. madagascariensis* in children at Port Louis, on Mauritius Island, off the west coast

[1] Published in full with illustrations and description of specimens in Philippine Journal of Science, v. 6, 2, section B.

of Madagascar, where, at the instigation of Blanchard, he had made a special search for the parasite. Two of the children were little girls of 5 years. The sex and age of the other two were not given. The specimen from one of the children was sent to Blanchard (R. Blanchard collection, No. 8). It consisted originally of three fragments which in transit were broken into eight and, according to Blanchard, represented parts of two worms. There was no head. Blanchard gave a brief description of the specimen the same year.

In the same year (1891) Leuckart reported that he had received from Krabbe a specimen of *Davainea madagascariensis* collected at Bangkok, Siam, from the 3-year-old son of a Danish sea captain, the child living on his father's ship, which was plying in Asiatic waters. Later in 1891 Leuckart reported the results of his study of the specimen, which consisted of a single worm about 24 centimeters long, and included the head. This material was further studied by Holzberg in 1897.

The fifth and last finding of the species prior to the present one was reported from South America in 1895 by Daniels, who obtained two specimens at autopsy from the jejunum of an adult male aboriginal Indian, at Georgetown, British Guiana. The heads were not found and, having only Davaine's original description of *D. madagascariensis* available, Daniels considered his specimens to be specifically distinct, and proposed a new species under the name "*Tænia demerariensis*?" A part of Daniels's material was sent to Sir Patrick Manson and through him reached Blanchard (R. Blanchard collection, No. 236), who established its identity with *D. madagascariensis*.

The history of the six findings of *Davainea madagascariensis* accordingly extends over a period of 42 years, and may be summarized as follows:

Grenet, 1867, Comoro Islands, two cases (18-months-old male child and 2-year-old girl from the Antilles and from Reunion, respectively;) two worms without heads; specimens studied and published with illustrations by Davaine in 1869.

———?, 1873, Nosse-Be Island, one case (3-year-old girl), one immature worm with head; specimen found in Davaine collection, studied and published by Blanchard in 1899 with figure of head.

Chevreau, 1891, Mauritius Island, four cases (two 5-year-old girls, two with age and sex not given); fragments of two worms without head sent to Blanchard and briefly described the same year.

Krabbe, 1891, Siam, one case (3-year-old Danish boy); one specimen complete with head; published by Leuckart in 1891. (Further studied by Holzberg, 1897).

Daniels, 1895, British Guiana, one case (adult male native), parts of two worms; no head; published in 1895 as *Tænia demerariensis* with illustrations; part restudied and published by Blanchard in 1899.

Andrews, 1909, Manila, P. I., one case (adult male Filipino), one complete worm and four nearly complete except the head; deposited, No. 305, in Helminthological collection, bureau of science, Manila, and reported in the present paper.[1]

Two other papers are of special interest in the history of this species:

In 1891 Blanchard established the genus *Davainea* with *D. proglottina* of poultry as type and about 25 other species, including *D. madagascariensis*.

In 1898 Holzberg published a careful study of the reproductive organs of the genus *Davainea*, Leuckart's specimen of *D. madagascariensis* being among the material examined.

GEOGRAPHICAL DISTRIBUTION.

The first three findings of *D. madagascariensis* in the islands off Madagascar (in 1867, 1873, and 1891) might well have been taken to indicate a possibly narrow range of distribution in that locality,

[1] It may be noted that, while Davaine named the species after Madagascar as indicative of the general ocality where the first specimens were found, the parasite has never been reported from Madagascar itself.

though one of Grenet's cases had come from the Antilles five months previously. Krabbe's case at Bangkok in 1891 at once widened this range greatly and suggested the possibility of a rather extensive distribution. Daniels's case in British Guiana in 1895, as pointed out by Blanchard, opened a new era in the history of the parasite and indicated a general distribution of the species throughout the Tropics. Still the parasite was not again encountered until Andrews's case in the Philippine Islands, after a lapse of 14 years, now completes the belt of distribution around the world and practically gives final proof of the more or less general tropical distribution of the parasite.

AGE DISTRIBUTION.

It is noteworthy, further, that while six of the eight cases reported in the first four findings of *D. madagascariensis* were young children, the age of the other two cases not being stated, the last two cases (Daniels's and Andrews's) were adults.

MARITIME ENVIRONMENT.

Another interesting point is the apparent relation between the incidence of the infection and maritime surroundings. The first 7 cases were insular and all 10 cases have been found at port towns. In addition, 2 of Chevreau's cases had arrived by ship two months and five months previously, and Krabbe's case, the son of a sea captain, was said to dwell on his father's vessel. The significance of this point with relation to the source of infection is problematical. It might signify that the intermediate host is some animal of wide distribution in the Tropics and particularly infesting such situations as ships and docks, such as the cockroach (*Periplaneta orientalis*), as Blanchard has suggested.

On the other hand, further investigation may show the parasite to exist in the interior as well, where there has been comparatively little opportunity for investigation heretofore; in which case the apparent relation between the infection and shipping would, in part at least, lose its significance. We are not aware of the previous occupation of Andrews's case, but his residence in Manila could scarcely fail to afford opportunity for infection about the ships and docks of the harbor and river, if such situations are the home of the intermediate host of the parasite. The Manila case taken alone, however, would seem to lend itself to almost any hypothesis regarding the source of infection, whether the intermediate host be an insect, mollusk, or fish. But taken together with our knowledge of the earlier cases, the fact of Manila being a seaport with a harbor and river full of docks and shipping surely strengthens rather than weakens the apparent relations which have been noted between infections with *D. madagascariensis* and maritime surroundings.

SOURCE OF INFECTION.

So far as we are aware no one has suggested any more plausible theory regarding the source of infection with this cestode than that of Blanchard, namely, that the intermediate host of the parasite is probably some animal of general tropical distribution particularly infesting ships and docks and that the cockroach (*Periplaneta orientalis*) would fulfil these conditions. This theory is based in part, of course, upon the analogy presented by the known life cycles of other species of *Davainea*, the larval forms of which live in arthropods or mollusks.

A PARASITE SPECIFIC TO MAN.

The question whether *D. madagascariensis* is normally parasitic in man or is an accidental parasite having as its normal host some other animal is naturally suggested by its comparatively rare occurrence in man and by the further fact that species of *Davainea* are so common in birds and so rare in other animals that it is considered distinctly a bird genus among parasites. But in 1899 Blanchard pointed out that, while the great majority of species of this genus were parasites of birds, some five species were then known to be parasitic in mammals, namely, three species in rodents, one in the anteater, and the one species in man; and he unhesitatingly expressed his opinion that *D. madagascariensis* was a normal and not an accidental parasite of man. That the species has now been found in man 10 times and has not been reported from any other host during a period of over 40 years of active helminthological research would seem to render it reasonably certain that we have in *Davainea madagascariensis* a parasite normal, and perhaps peculiar, to the genus *Homo*.

ZOOLOGICAL POSITION AND DESCRIPTION OF THE SPECIES.

According to a late classification the *Davainea* group of Cestoda, i. e., tapeworms characterized chiefly by peculiar hammer-shaped hooks on the rostellum, have been placed in a separate family, Davaineidæ Fuhrmann, 1907, the other three families of Cestoda being the Tæniidæ Ludwig, 1886 (represented among the tapeworms of man by the genus *Tænia*); the Hymenolepididæ Railliet and Henry, 1909 (represented among the tapeworms of man by the genera *Hymenolepis* and *Dipylidium*), and the Dibothriocephalidæ Luehe, 1899 (represented among the tapeworms of man by the genera *Dibothriocephalus* and *Diplogonoporus* and the collective group of immature forms *Sparganum*).

Davainea is the only genus of Davaineidæ reported for man, and of the 20 to 25 species of *Davainea* we have two species among human parasites, namely, *D. madagascariensis* (Davaine, 1869) and *D. asiatica* (Linstow, 1901), the latter having been reported but once.

For convenience of reference the diagnoses of the genus *Davainea* and of the two species *D. madagascariensis* and *D. asiatica* are here reprinted from Stiles, 1906:

Genus DAVAINEA Blanchard & Railliet, 1891.

GENERIC DIAGNOSIS.—*Davaineinæ:* Scolex with a rostellum armed with numerous hammer-shaped hooklets, arranged in two rows. Suckers with several rings of small hooklets. Genital pores usually unilateral, less frequently irregularly alternate. Eggs in egg capsules, in nearly the entire middle field of the segments. Parasitic in mammals and birds. Larval form (a cysticercoid) in mollusks and arthropods.

TYPE SPECIES.—*Davainea proglottina* (Davaine, 1869).

The Madagascar tapeworm, DAVAINEA MADAGASCARIENSIS (Davaine, 1869) Blanchard, 1891.

SPECIFIC DIAGNOSIS.—*Davainea:* Strobila attains 25 to 30 centimeters in length by 1.4 millimeters in breadth and is composed of 500 to 600 segments, of which the last 100 are gravid and form one-half of the total length of the worm. Head with four large, round suckers; rostellum retractile, 0.1 millimeter in diameter, plump, with 90 peculiar hooks (18 μ long) at its equator; the inner surface of the rostellum-pouch provided with numerous minute points, which are found also on the inner surface of the suckers. Proximal segments broader than long; gravid segments become longer than broad (2 by 1.4 millimeters) and resemble apple seeds in shape; the distal 100 segments compose about one-half the entire worm. Calcareous corpuscles present. Sexual development very rapid, so that segments 3 centimeters from the head are in copula. Genital pores unilateral, near proximal corner of segment; genital cloaca deep. *Male organs:* Cirrus pouch bottle-shaped; ductus ejaculatorius very long and sinuous, provided with prostatic gland-cells; testicles numerous, 50 or more. *Female organs:* Receptaculum seminis unusually long and broad, extending to median line of segment and communicating with oviduct; shell-gland included in the vitelloduct; uterus composed of a number of tubes which roll up each side in a nearly globular ball; when uterus is filled with eggs the windings of the uterus unroll, extend throughout the segment, and lose their walls, so that the eggs now lie free in the parenchyma; the eggs then become surrounded, singly or two or three together, by parenchymatic cells, forming egg balls, of which 300 to 400 are present. Onchosphere (8 μ to 15 μ) is surrounded by two clear shells, the outer bearing two mammillate projections.

The Asiatic tapeworm, DAVAINEA ASIATICA (Linstow, 1901).

SPECIFIC DIAGNOSIS.—*Davainea:* Length 29.8 centimeters, maximum breadth 1.276 millimeters, composed of about 750 segments. Head unknown. Segments all broader than long, varying in size from the anterior to the terminal as follows: 0.16 millimeters; 0.67 by 0.32 millimeters; 1.056 by 0.352 millimeters; 1.276 by 0.88 millimeters; 1.78 by 0.99 millimeters; thickness, 0.238 in middle segments to 0.484 in terminal segments; the distal margin of each segment extends over the proximal margin of the next following segment. Cortical layer one-fifth of dorso-ventral diameter of segment. Ventral canals very large, three-fifths of dorso-ventral and one-sixth to one-eighth of lateral diameter of segment, connected distally in each segment by transverse canal 88 microns in diameter; dorsal canals much smaller, one-fourteenth of dorso-ventral and one-sixtieth of transverse diameter of segment, situated dorso-median of ventral canals. Lateral nerve about halfway between ventral canal and lateral margin. Calcareous corpuscles absent. Maturity of segments attained about 35 millimeters from anterior end of strobila. Genital pores unilateral in proximal third of margin. *Male organs:* Testicles, 35 to 44 microns in

diameter, 14 or 15 on each transverse section, arranged in single dorsal and ventral rows; vas deferens extends in convolutions about one-third across the segment, dorsally of longitudinal canals and nerves; cirrus pouch pyriform, 79 microns long by 49 microns broad, does not quite reach the longitudinal nerve. *Female organs:* Ovary extends across the segment, from ventral canal to ventral canal; vitellogene gland nearly globular, median, dorsal of ovary, its transverse diameter about one-eighth of the segment; vulva dorsal of cirrus; vagina extends dorsally of nerve and lateral canals, and at dorsal canal it widens into large, elongate, receptaculum seminis; uterus breaks up into 60 to 70 egg balls in each segment; mature eggs not observed, but probably about 38.6 by 36.4 microns.

HABITAT.—Adult in intestine of man. Larval stage unknown, probably in some invertebrate.

GEOGRAPHIC DISTRIBUTION.—Known only for Aschabad, Asiatic Russia.

IDENTITY OF ANDREWS'S SPECIMENS.

Certain not insignificant differences were noted between the anatomical structure of the Philippine specimen and the structure described for earlier specimens of *Davainea madagascariensis*. These differences were such that it seemed at first that we must be dealing with another species. Further study of the specimen and a careful comparison in detail with the figures and descriptions of other authors have convinced us that, while certain differences exist seemingly scarcely consistent with the specific identity, an actual comparison of the different specimens will be necessary before the real value of such variations can be ascertained. Such a comparative study should prove most interesting and valuable in clearing up as well certain anatomical differences apparently existing among the several specimens heretofore described. Until the actual comparison of specimens can be made there is no doubt that Dr. Andrews's specimen found in the Philippines belongs with those of Grenet, Chevreau, Krabbe, and Daniels in the species *Davainea madagascariensis* (Davaine, 1869) Blanchard and Railliet, 1891.

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THE INTERPRETATION OF NEGATIVE AND WEAKLY POSITIVE REACTIONS IN NOGUCHI'S COMPLEMENT FIXATION TEST.

By Passed Asst. Surg. M. E. HIGGINS, United States Navy.

In the second edition of the Serum Diagnosis of Syphilis Noguchi classifies the end results of the reaction as follows: Positive; negative; doubtful; weakly positive; very weakly positive; and faintly positive. These results vary with the degree of hemolysis, which is complete in the negative reactions and entirely absent in positive cases. Noguchi says:

> If 60 or 70 per cent of the bulk of the corpuscles is dissolved the reaction is doubtful and should not be taken into consideration for diagnosis,

and further,

> neither the weakly positive nor the faintly positive reaction should be accepted as a definite diagnosis of syphilis without the presence of strong clinical evidence in favor of such a diagnosis.

The effect of treatment profoundly modifies the reaction. In summarizing the influence of mercurial treatment Noguchi says:

> While it seems settled among the profession that a positive reaction is an indication for additional treatment, it is not definitely established that the disappearance of the reaction is justification for the cessation of treatment, especially as the reaction may be quickly affected by treatment.

Statistics relative to the effect of "606" show that after treatment with this drug the reaction becomes weaker and in some cases disappears in from two to seven weeks; other cases remain positive.

From the foregoing it is obvious that great care should be exercised in the consideration of any but a distinctly positive reaction. The weakly positive and the faintly positive reactions without strong clinical evidences of lues are not to be accepted as bespeaking a definite diagnosis.

A negative reaction may mean either that the individual has never had syphilis, that he has had syphilis and been cured, or that owing to treatment the reaction has disappeared. As the reaction may be negative after two or three months' treatment with mercury its absence can not always be a justification for the cessation of treatment.

SPECIMENS ADDED TO THE HELMINTHOLOGICAL COLLECTION, UNITED STATES NAVAL MEDICAL SCHOOL, MARCH–MAY, 1911.

Accession No.	Name.	Host.	Collected by or received from—
19729	Hookworms	*Homo*	W. M. Kerr, Guam, M. I.
19730	do	do	Do.
19731	*Oxyuris vermicularis*	do	E. R. Stitt, Canacao, P. I.
19732	*Agchylostoma duodenale*	do	Do.
19733	*Clonorchis sinensis*	do	Do.
19734	*Agchylostoma duodenale*	do	Do.
19735	*Necator americanus*	do	Do.
19736	Hookworms	do	Do.
19737	do	do	Do.
19738	*Filaria immitis*	do	Do.
19739	*Dermatobia cyaniventris* (larvæ)	*Homo* (scalp)	J. G. Ziegler, Camp Elliot, Canal Zone.
19740	Larval ticks	Adults from bat	E. R. Stitt, Canacao, P. I.
19741	do	Adults from dog	Do.
19742	*Tænia saginata*	*Homo*	J. A. Randall, New Orleans.
19743	*Trichinella spiralis* (embryos)	White rat	Garrison & Avery, Naval Medical School.
19744	*Trichinella spiralis* (adult)	do	L. Avery, Naval Medical School.
19745	*Physaloptera?*	Badger	A. H. Dodge, Naval Hospital, Las Animas.
19746	Trematodes	*Aegialitis dubia*	E. R. Stitt, Canacao, P. I.
19747	Lice	Carabao	Do.
19748	Filaria	Bird	Do.
19749	Nematodes	(?)	Do.
19750	Filaria	(?)	Do.
19751	*Davainea*	Fowl	Do.
19752	*Hymenolepis nana*	*Homo*	P. E. Garrison, Naval Medical School.
19753	Ova; *Schistosoma japonicum*	do	Do.
19754	Ova; *Paragonimus westermanii*	do	Do.
19755	Coccidia	*Lepus*	Do.
19756	*Fasciola*	*Bos taurus*	Do.
19757	*Ascaris lumbricoides*	*Homo*	Do.
19758	Nematodes	*Felis domestica*	Do.
19759	*Dipylidium*	do	Do.
19760	*Dibothriocephalus*	do	Do.
19761	*Gnathostoma*	do	Do.
19762	*Filaria immitis*	*Canis familiaris*	Bureau of science, Manila.
19763	*Agchylostoma duodenale*	*Homo*	Do.
19764	*Opisthorchis felineus*	*Felis domestica*	Do.
19765	Tapeworm	White rat	Do.
19766	*Oxyuris vermicularis*	*Homo*	Do
19767	*Trichuris trichiura*	do	Do.
19768	Hookworms	*Canis familiaris*	Naval Medical School.
19769	*Cysticercus pisiformis*	*Lepus timidus*	Do.
19770	*Necator americanus*	*Homo*	Igarovidez, P. R.

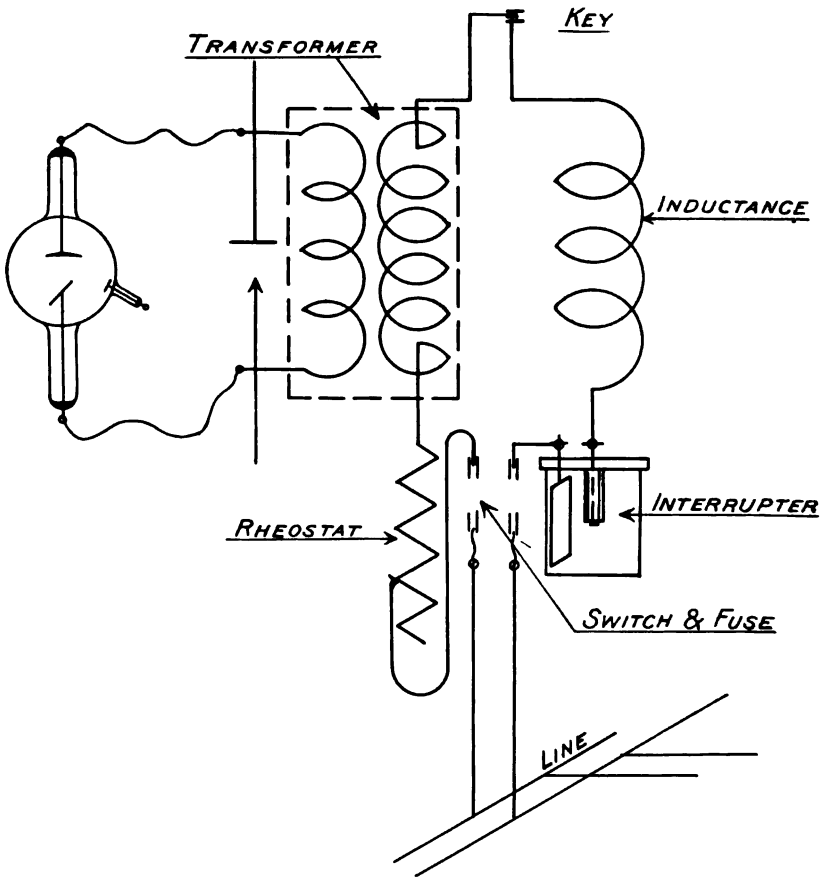
SPECIMENS ADDED TO THE PATHOLOGICAL COLLECTION, UNITED STATES NAVAL MEDICAL SCHOOL,[1] MARCH–MAY, 1911.

Accession No.	Tissue.	Diagnosis.	Collected by or received from—
508	Mammary gland	Malignant tumor	J. F. Leys, naval hospital, Newport, R. I.
509	Inguinal glands	Hodgkin's disease?	J. M. Brister, naval hospital, Annapolis, Md.
510	Cervical glands	Tuberculosis	G. F. Cottle, Samoa.
511	Skin (filarial?)	(?)	Do.
512	Tendon sheath (wrist)	Round cell infiltration	Do.
513	Epitrochlear	Fibroid tumor	Do.
514	Femur	Leukæmia	W. J. Pugh, naval hospital, New York.
515	Spleen	Miliary tuberculosis	Do.
516	Kidney	Leukæmia	Do.
517	do	Cloudy swelling of tubules	Do.
	Heart	Normal	Do.
518	Spleen	Myelogenous leukæmia	Do.
519	Lung	Peribronchial infiltration with round and epithelial cells.	Do.

[1] Many of the diagnoses given in the above list are merely provisional or approximate, and in no case should the diagnosis given be considered in the light of an official report. Such reports are made directly by letter.

Specimens added to the pathological collection, United States Naval Medical School, March–May, 1911—Continued.

Accession No.	Tissue.	Diagnosis.	Collected by or received from—
520	Peritoneal glands	Tuberculosis	W. J. Pugh, naval hospital, New York.
521	Spleen, liver, kidney, cerebrum (sections).	Pernicious malaria	W. L. Irvine, U. S. S. Marietta.
522	From a horse	Fibroma	R. Spear, Naval Medical School Hospital.
523	Mammary gland (suspected carcinoma).	Nonmalignant	J. H. Iden, U. S. S. Washington.
524	Testicle and hydrocele sac	Normal increase of connective tissue in tunica albuginea. No filarial embryos found.	G. F. Cottle, Samoa.
525	Stomach, duodenum, and jejunum.	Carcinoma	Do.
526	Lymph gland	Connective tissue proliferation	Do.
527	Tibia	Normal	R. Spear, Naval Medical School Hospital.
528	Crystalline lens	do	E. M. Shipp, Naval Medical School Hospital.
529	Male breast	Nonmalignant fibroma	A. M. Fauntleroy, U. S. S. Solace.
530	Brain	Cerebro-spinal meningitis	M. E. Higgins, Naval Medical School.
531	Tumors removed from sterno-cleido-mastoid muscle.	"Branchial cysts"	R. M. Kennedy, naval hospital, San Juan, P. R.
532	Gall bladder	Hypertrophied	R. Spear, Naval Medical School Hospital.
533	Liver (guinea pig)	Tuberculosis	O. J. Mink, Naval Medical School.
534	Hydrocele cord		E. H. H. Old, Naval Medical School Hospital.
535	Spinal cord, medulla, and brain.	Normal (examined for tetanus)	G. B. Crow, Guam, M. I.
536	Uterine tumor	Malignant adenoma	Stalnaker and Shepard, Culebra, P. R.
537	Liver, lung, and spleen	Myelogenous leukæmia	M. E. Higgins, Naval Medical School.
538	Brain	Meningitis	Do.
539	Liver	Abscess	E. R. Stitt, naval hospital, Canacao, P. I.
540	Intestine	*Balantidium coli*	Do.
541	Spinal cord	Landry's paralysis	Do.
542	Breast	Scirrhous carcinoma	R. Spear, Naval Medical School Hospital.
543	Intestine (pig's)	Hog cholera	Army Medical Museum.
544	do	do	Do.
545	Kidney	(?)	Do.
546	Spleen	(?)	Do.
547	Liver	(?)	Do.
548	Kidney	(?)	Do.
549	Spleen	Cancer (?)	Do.
550			Do.
551			Do.
552	Heart and aortic arch	Aortic aneurism	C. S. Butler, Naval Medical School.
553	Mass obtained from site of injection of salvarsan.	Chronic inflammatory infiltration of round cells.	U. R. Webb, naval hospital, Mare Island.
554	Lip	Round cell infiltration, no signs of malignancy.	R. Spear, Naval Medical School Hospital.
555	Cervical glands	Tuberculous	Do.
	Tonsils	Increase of connective tissue	Do.
556	do	do	Do.
557	Tumor from neck of Alaskan Indian.	Sarcoma	J. A. B. Sinclair, naval hospital, Sitka, Alaska.
558	Testicle	Tuberculosis	C. M. Oman, naval hospital, New York, N. Y.
559	do	do	Do.
560	Prostate gland	Hyperplasia of muscle and connective tissue. Proliferation of glandular elements.	Do.



AN IMPROVISED X-RAY APPARATUS. SEE PAGE 331.

SUGGESTED DEVICES.

AN IMPROVISED X-RAY APPARATUS.

By Hosp. Steward H. A. Harris, United States Navy.

The X-ray apparatus illustrated in the figure on the opposite page has been installed at the dispensary, navy yard, Mare Island, Cal. After more than six months' use it has been demonstrated that the apparatus is economical, practical, and now indispensable. It has been operated nearly every day during this period with complete success and is exceptionally well adapted for fluoroscopic examinations, as it requires no "tuning up." This is due to the fact that it has been possible to rectify the current without using an electrolytic rectifier. In therapeutic work it has been run 10 to 15 minutes without overheating any part.

The radiographs, for definition and sharpness, are considered excellent. The energizing system is composed of one Lodge-Muirhead 8-inch induction coil. The coil's primary is connected in series with the interrupter, inductance, and rheostat. The inductance was obtained from a discarded arc lamp and needs no further description.

It is well known that to operate an X-ray tube a current of one direction is essential; that is to say, a potential in one direction must predominate. The elementary sketch attached shows clearly the connections.

The rectifying interrupter deserves attention. It is known that the only current available in quantity at the yard dispensary is alternating, and no tube is free from transverse currents when energized with a sinusoidal current. To overcome this the elements iron and lead were placed in a 20 per cent solution of sulphuric acid in water, adding to this 3 ounces of ammonium phosphate. The glass jar containing the solution has a capacity of about 1 gallon.

The positive element iron—a stub steel rod about three thirty-seconds of an inch in diameter—is inserted into a tight-fitting rubber tube. This insulates all parts except the immersed end, the other end protruding above for external connection. The negative element is an ordinary lead plate.

This interrupter rectifies the A. C. current, increases the frequency and efficiency, and does away with the cumbersome chemical rectifiers now in use. The consequence is that the apparatus is very simple and therefore very reliable.

The frequency does not vary from two above to two below 120 cycles per second; therefore we may consider the frequency as constant. The current varies slightly with time, due to the deterioration of the positive element, but this variation can easily be adjusted in a few seconds. The tube glows brilliantly and a distinct division of the cathode and anode rays is seen when using a current varying between 9 and 7 amperes.

The total cost of the interrupter does not exceed $5; no element exceeds $2 in cost.

The solution has been used successfully on intermittent work for three months. The radiographic effects have been improved by the addition of a small amount of powdered alum. This modifies the peak of the wave and causes the tube to become more mellow.

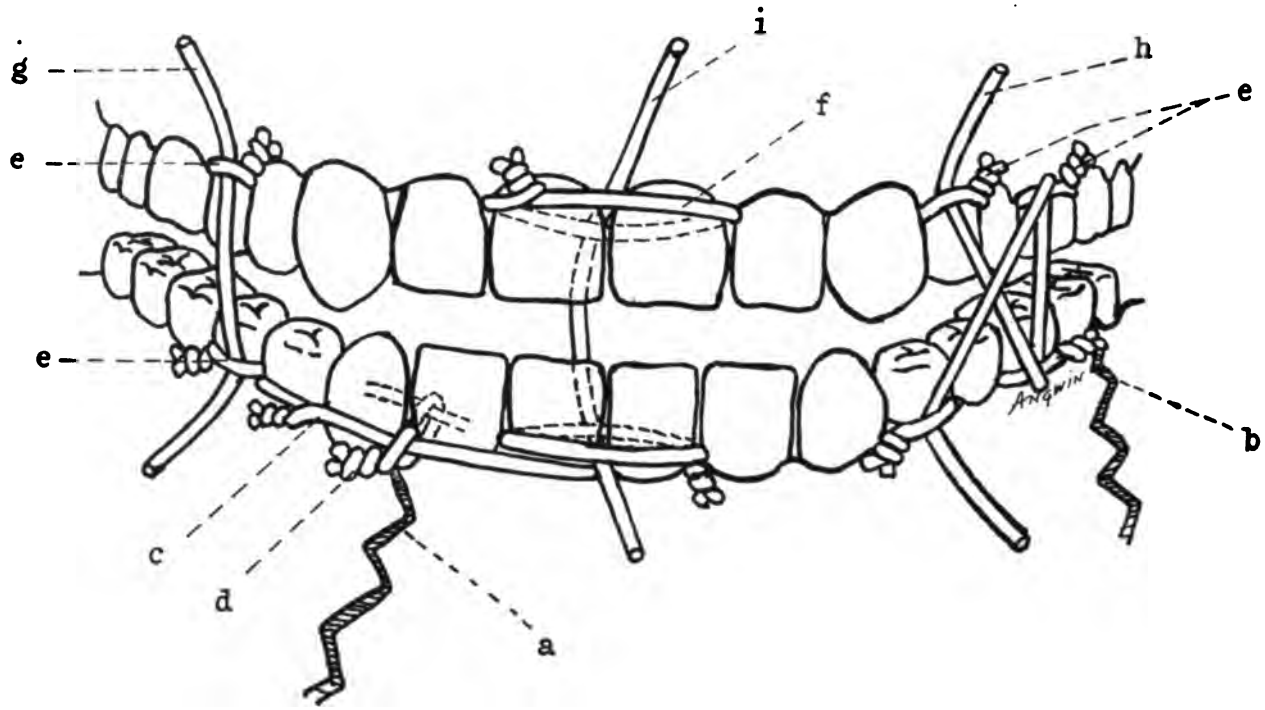
FRACTURE OF MANDIBLE, WITH IMPROVED METHOD OF ADJUSTMENT

By Passed Asst. Surg. W. A. Angwin, United States Navy.

Fractures of the lower jaw are not uncommon in the naval service and are generally the result of violence. As a rule they are compound through the mucous membrane of the mouth and not infrequently through the skin of the face. The usual site of these fractures is forward of the mental foramen. The diagnosis is easy and the reduction is comparatively simple, but a permanent adjustment with perfect apposition of the teeth is not so readily obtained. The essential requirements of treatment are reduction of fragments, dental apposition, permanent immobilization, and oral cleanliness. Of these the most important is absolutely perfect occlusion, with a restoration of the "bite." If this is accomplished, the fragments are properly reduced.

It is desired to present a simple and expeditious method for the permanent fixation of the mandible with the teeth in perfect apposition by means of interdental wire sutures. In a case which recently occurred aboard the U. S. S. *California* the fracture was a double one—posteriorly, on left side, a transverse break through socket of proximal root of third molar, breaking the root from the tooth; anteriorly, on right side, a transverse break through socket of bicuspid, proximally, loosening that tooth. (See fig., *a* and *b*.) The segment was drawn downward and inward by the muscles of the neck, while right fragment of jaw was drawn downward and outward. The mucous membrane was broken on both sides of alveolar process at sites of both fractures.

A piece of German silver wire, 22 gauge, was procured from electrical stores, stripped of its insulation, and cleaned. The ordinary soft-silver suture wire was found to be unsatisfactory, as it tended



A METHOD OF WIRING A FRACTURED MANDIBLE. SEE PAGE 332.

cleanliness was maintained by washing the mouth and carefully sponging the gums and buccal surface of the teeth.

Neither nasal nor postdental tube or extraction of sound teeth was needed as an aid to feeding. The patient simply and without difficulty sucked between his artificially clenched teeth his diet of broths, soup, ice cream, etc.

The apparatus was left on for about three weeks, at which time the tractors were cut, but anchor loops were left in position. As there was still slight mobility between the fragments, the tractors were replaced and not removed until 10 days more had passed. Following their final removal, soft diet was allowed and patient cautioned about using strong mastication. After a few days the anchors and the retaining wire across the anterior fracture were removed, and the patient made an "uneventful recovery."

This anchor and tractor method, with the through and through central tractor, gives us a simple, easily applied means for securing perfect apposition, absolute fixation, and fragment immobilization. Furthermore, a point of importance in naval surgery, the appliances are always at hand.

GUNSHOT WOUND OF THE ELBOW. FRAGMENTS OF SHATTERED BONE ARE SHOWN IN SITU. SEE PAGE 335.

CLINICAL NOTES.

GUNSHOT WOUND OF THE ELBOW.

By Surg. RAYMOND SPEAR, United States Navy.

J. E. P., P. M., age 25, was adjusting the sling of his rifle, a Krag, when the firing pin was caught and the rifle discharged. The muzzle at the time of discharge was about 4 inches from the skin. The bullet and gases entered on the anterior surface of the left elbow, making a lacerated wound about the size of a silver half-dollar piece. The lower end of the humerus was completely shattered and disorganized into pieces varying from the size of grains of sand to that of splinters 1½ inches in length, the triceps muscle was severed completely and protruded through a large gaping wound on the back of the arm. Some splinters of bone were afterwards found attached to the ceiling in the room in which the accident occurred.

The jacketed bullet after piercing the humerus and arm went through a 3-inch wooden joist and then through a tiled roof. A portion of the jacket was found in the tile, but the leaden core went on and was lost.

The man was taken immediately to the Naval Medical School Hospital and two coats of tincture of iodine diluted with equal parts of alcohol were applied directly to the wound and also to the skin of the arm and forearm. The first coat was applied at the beginning of the anæsthetic and the second coat 15 minutes later. The operation was begun when the second coat had dried, and consisted in removing all the splinters of the disrupted end of the humerus through the large wound of exit. Most of the splinters were free; the periosteum of the attached splinters was saved whenever possible. The contused and lacerated edges of the torn triceps were trimmed and sewed together with kangaroo tendon. Through and through drainage was established and the arm was put on an internal angular splint. The nerves and blood vessels supplying the forearm fortunately were not injured.

The convalescence was uneventful; the wound despite the great traumatism it had received healed without suppuration. The arm is 2½ inches shorter than it was before injury, but the man has a good strong grip and a movable joint at the elbow; extension is normal and flexion is slightly less than normal. Callus has formed around the

lower end of the humerus and from the periosteum that was left, and the ligaments hold the bones in position, so that a very useful joint has resulted.

The case is interesting not only on account of obtaining a movable joint, but also it is an example of what may be expected in the treatment of gunshot wounds with tincture of iodine.

CLINICAL SYMPTOMS APPEARING IMMEDIATELY AFTER ANTITYPHOID INOCULATION.

By Asst. Surg. J. R. PHELPS and Asst. Surg. G. F. CLARK, United States Navy.

R. McL., a private marine, age 24 years, was admitted to the medical service of the U. S. S. *Solace* April 22, 1911, from the naval station Guantanamo Bay, Cuba. It was reported that he had been vaccinated against typhoid fever, the first inoculation of 500,000,000 dead bacilli having been given four days before. He felt perfectly well at the time of and previous to the inoculation. Two days later he was admitted to the sick list, acutely ill with high fever (104.6° F.), headache, and dulled intellect.

On admission to the hospital ship he presented the appearance of a very sick typhoid case in the second week of the disease. The spleen was enlarged and readily palpated. His temperature was 104° F.; pulse, 102, soft and dicrotic; and respiration, 22. He was actively delirious from the time of admission and required the constant presence of a nurse at the bedside to prevent his getting up. He did not stand baths well, and considerable prostration, cyanosis, and impairment of pulse quality followed. The baths did not lower the temperature more than a few tenths of a degree. The urine was concentrated, showed a large trace of albumin, and contained many hyaline and finely granular tube casts, but no blood. The diagnosis of typhoid fever was confirmed by a marked leucopænia (2,000 white cells) and a Widal reaction showing strong agglutination and loss of motility in 20 minutes with 1:40 dilution.

The patient showed the effects of intense toxemia, and after 24 hours of hospital treatment he began to get worse rapidly. The pulse rose to 140 in two hours, becoming soft and running. Carphologia, muttering delirium, and subsultus tendinum were present. The urine became scanty, and the little which was excreted was lost in several involuntary bile-stained liquid bowel movements which came at frequent intervals. The temperature remained about and usually above 106° F. by rectum. He was given four intravenous infusions of normal salt solution, 500 cubic centimeters at a time. Salt solution was also introduced by hypodermoclysis several times, and so long as it was readily absorbed. Each infusion was followed

GUNSHOT WOUND OF THE ELBOW, SHOWING POSITION OF BONES IMMEDIATELY AFTER OPERATION. SEE PAGE 335.

hastily, it is well to bear in mind that ambulatory cases of typhoid are notorious for the late intensity of symptoms and to remember that such cases carry with them a high mortality.

It is interesting to note the free formation of agglutinins and precipitins in this case. It is possible that the specific immunity was very strong and that the rapid destruction of bacilli overwhelmed the individual with typhotoxin. There is to be considered the advisability of smaller dosage in vaccinating in a typhoid community. We lean to the belief that from 200,000,000 to 250,000,000 dead bacilli are sufficient for the first inoculation, to be followed in 10 to 12 days by 500,000,000, and that strong immunity can then be secured by the full dose of 1,000,000,000, given finally after the second interval of 10 or 12 days. We are impressed with the importance of taking temperatures before inoculation, where practicable, and not trusting to the individual's statement that he feels all right.

[The vaccine administered in the above-described case was that which is manufactured by the Medical Department of the United States Army and has been used with such excellent results as a prophylactic against typhoid fever in thousands of instances in the Army and Navy.

The extensive and effective use of the vaccine without accident leads us to the conclusion that this patient was probably near the end of the incubation period of a virulent typhoid infection and that the inoculation, if of any effect in determining the result, operated by introducing into the case the factor of the so-called negative phase.

All of the facts considered, it appears that this virulent typhoid infection was about to fulminate; that the inoculation was coincident, and that probably this man would have died had he not received the inoculation.

Had he been fortunate enough to be inoculated a sufficient time before the infection occurred, it is probable, in view of the brilliant results which have been achieved in prophylaxis against typhoid fever, that this life would not have been lost. The inoculation came too late.]

POSTERIOR GASTROENTEROSTOMY THREE YEARS AFTER ANTERIOR GASTROENTEROSTOMY.

By Surg. A. M. Fauntleroy, United States Navy.

Below is given the text of a report of an interesting case published by Surg. A. M. Fauntleroy, United States Navy.

As the description can not be abstracted without loss of valuable detail necessary to the careful consideration of the case, the words of the author are published as they appeared in the Annals of Surgery for January, 1911:

This man, whose case is given below, has the unusual distinction of possessing two gastroenterostomies, one anterior and one posterior, the latter having been performed three years after the former.

H. A. W., unmarried, age 22 years and 11 months. Case paper No. 275, United States naval hospital, Philadelphia, Pa. Admitted from the U. S. S. *Lancaster* on October 8, 1910, with a diagnosis of gastric ulcer.

Has always been in robust health up to the age of 17, when he began to have a more or less continuous localized epigastric pain in the midline. He dates this trouble from a time when he was lifting a heavy weight, causing, as he states, a lump to appear to the right of the umbilicus, which, however, shortly passed away and has never reappeared. Pressure over the epigastric region intensified the pain, and at this time the pain was present at practically all hours of the day and night so that he could not sleep.

He was transferred to the United States naval hospital, Annapolis, Md., in April, 1907, with a diagnosis of gastric ulcer, having vomited blood very copiously just before transfer to the hospital. Nothing further is noted on the patient's case paper at this time except that the pain continued, requiring at times morphia, and that he was becoming progressively thinner. In July, 1907, an anterior gastroenterostomy was performed at the United States naval hospital, Annapolis, Md., and a Murphy button was used to effect the anastomosis. There was marked improvement after the operation, there being a cessation of all pain, and when the patient was discharged to duty four months later he had gained 36 pounds. Shortly after he had been discharged he contracted scarlet fever, from which he made a complete recovery. The patient's case paper further states that at the time of his discharge to duty after operation the Murphy button had not been passed, and that several skiagraphs taken at this time showed the button in position.

Patient was free from all symptoms until the latter part of September, 1910, when the pains began to return about an hour after eating meals; these pains were relieved by taking bicarbonate of soda. On the morning of October 8, 1910, there was a moderately severe hæmatemesis and he was transferred to the United States naval hospital, Philadelphia, Pa., for further treatment.

On admission to this hospital he was slightly emaciated, but with fair color. There was no pain or tenderness even on deep pressure in the epigastric region. On the evening of the day of his admission he had a rather copious hemorrhage from the stomach and another on the evening of October 9. In the early morning of October 11 there were two very copious hemorrhages, and a stool passed at this time was black and tarry. There was still no pain and the patient's belly was abnormally flat. The vomited blood in each instance was markedly acid. At this time there was marked pallor and weakness, with a pulse of 126, and immediate operation was decided upon and the patient prepared accordingly.

Operation.—Ether anæsthetic. Before the anæsthetic was started the right median cephalic vein was opened and salt infusion begun. This was kept up during the entire operation, 2,200 cubic centimeters being introduced in all. An incision was made to the right of the old scar and the abdomen rapidly opened from the ensiform cartilage to 8 inches below. On opening the abdomen and viewing the parts, there was seen a more or less conglomerate mass, consisting of omentum and small intestine which seemed to be glued together over the region of the stomach. These adhesions were carefully and slowly broken up with the aid of a gauze pad, and only once was it necessary to use the scissors. In this latter instance there was a broad, dense, as well as short, band of adhesions which anchored the upper anterior part of the stomach to the diaphragm. This was carefully snipped away and a few bleeding points ligated with small silk. On the removal of this band of adhesion the stomach was more plainly visible and allowed of much freer manipulation. After about 20 minutes of separating adhesions, the former anterior gastroenterostomy was plainly made out and the limbs of the gut identified.

The entire stomach was carefully palpated with the idea of possibly locating the indurated margin of an ulcer, but no spot could be "incriminated" as a possible bleeding point. The stomach was about three times as large as normal, and the pylorus and upper duodenum were dwarfed and thickened. It could be plainly seen from the high position of the former anterior anastomosis that the stomach was not being drained properly, since clotty blood could be felt through the stomach walls below the level of this anastomosis. In view of the above, it was decided to perform a posterior gastroenterostomy in the most dependent part, including a part of the greater curvature as recommended by the Mayos. The greater omentum was ligated and removed for a distance of 3 inches along its attachment to the greater curvature, and the lines of the gut leading from the old anterior anastomosis were selected to form part of the new posterior anastomosis. An opening was made in the gastrocolic omentum by blunt dissection, and the lower posterior surface of the stomach pushed through from behind. Moynihan's clamps were used, and a 3-inch incision was made in both stomach and intestine after the clamps had been secured in position and after the posterior seromuscular silk suture had been placed. The intestinal and gastric mucous membrane was trimmed and sutured together with silk, and the posterior seromuscular suture continued around to form the anterior seromuscular suture in the usual way.

After the patient had recovered from the ether he was placed almost in Fowler's position, with the idea of encouraging the complete drainage of the stomach through the large new opening. The after-treatment consisted of nothing by the mouth for five days, during which time the only nourishment he received was 500 cubic centimeters of salt solution by rectum every six hours. At the end of this time small feeds of peptonized milk, chicken broth, and albumin water were allowed every two hours. These were borne well and gradually increased, until at the present time (38 days after operation), the patient is practically on full diet and has been walking out in the hospital grounds for the past week. The first few days after operation the patient complained of great thirst, but with this exception and a slight post-operative rise of temperature he has not had an untoward symptom. His bowels move regularly and are of normal color and consistence.

This case illustrates in a striking manner the importance of securing prompt and efficient drainage where copious hemorrhage from the stomach is a prominent feature, and it is believed that an early operation is indicated where the first few days of medical treatment apparently have no effect on the outpouring of blood in the stomach. The gastric juice drains off immediately and does not digest an existing ulcer or denuded surface, and it is also believed that there is a contraction of the organ with a consequent arrest of hemorrhage. No Murphy button was found at the site of the old anastomosis, and it was doubtless passed without the patient knowing it.

PONTINE HEMORRHAGE RESULTING FROM A BLOW IN BOXING.

By Surg. Holton C. Curl, United States Navy.

The following case is briefly reported because of its bearing on athletics in the Navy and because of the very interesting findings at autopsy.

H. F. U., ordinary seaman; age 21, a powerfully built, normal young man was boxing on board ship on the evening of February 23, 1911. After a particularly lively exchange of blows the patient staggered and fell; he did not regain consciousness.

During the first few hours after the accident, his pulse was, for the most part, rapid and of high tension (200 millimeters), though there

were periods of alarming depression and weak heart action. There was at first slight fever but later temperature rose to 106° F.; breathing was stertorous, the pupils were unequal and did not respond to light.

A "grunting" vocalization could be elicited by pressure on an extremity or by changing his position, though real consciousness was never present.

There was a spastic condition of arms and legs, more pronounced on right side. Babinski reflex well marked on right side.

As patient was steadily becoming worse, he was transferred to hospital, where a left subtemporal decompression was done. Membranes and brain were found to be normal to inspection and touch; cerebral pulsation normal and no bulging. No change followed operation and death took place three hours later.

At autopsy an abnormally thin skull was found, as had already been noted at operation; membranes and outer surface of brain normal except for a very slight extravasation over left vertex. No other gross changes could be seen. Material for microscopical sections secured.

Laboratory report.—Sections from the pons showed numerous minute areas of hemorrhage varying from the size of a pin point to those only visible microscopically. The tissue surrounding the ruptured capillaries showed laceration, and were packed with red cells. Sections taken from floor of fourth ventricle failed to show these minute hemorrhages.

This, then, seemed clinically to be an "atypical" case of "concussion" with symptoms of cortical irritation, but the symptoms were really due to many minute lacerations of the pons, with extravasations.

The extreme thinness of the skull was interesting and was probably a definite causative factor.

FRACTURE OF THE ZYGOMA.

By Surg. R. B. Williams, United States Navy.

Uncomplicated fracture of the zygoma is an accident of considerable rarity, some surgeons of experience having never seen a single instance of it. It is for this reason that the following case is deemed worthy of report:

H. O'G., seaman, United States Navy, while boxing with 5-ounce gloves, was struck by his opponent on the right side of the head. The blow was a jab to the face of great force, delivered by a very powerful adversary.

The patient was not stunned, but felt the blow, he said, to his finger tips. It was immediately noticed by onlookers that there was a depression in the side of the boxer's face. Inspection showed marked

depression and dimpling of the skin over the right zygoma. Palpation showed a fracture just behind the middle of the zygoma, with inward angulation at the point of fracture. The zygoma on the left side was unusually prominent and arched. This arch had entirely disappeared on the injured side, and was replaced by a depression. The day following the accident ether was given, and the deformity was corrected in the following manner:

By means of a large, well-curved Hagedorn needle, passed from below upward, a section of a steel nasal-snare wire was carried beneath the zygoma at about the point of fracture, the two ends of the wire emerging above and below the zygoma. The two ends of this wire were twisted together and the hand protected by a pad of gauze. When strong traction was made, the bone could be felt to give, but after employing very forcible traction and not effecting reduction, it was decided to make a small incision over the fracture. The incision, about 1 inch in length, was made in the long axis of the zygoma. Examination with finger in the wound showed that the bone was fractured about its middle, and that the two ends of the fracture met at an obtuse angle. The periosteum was apparently not torn. With an assistant's finger in the wound making slight counter pressure, very forcible traction was made on the wire, and after exerting a great deal of force, the bone could be felt to spring back into place, and the deformity entirely disappeared. The small wound was closed by a silkworm-gut subcuticular suture, and the ends of the wire were twisted over a roll of gauze to prevent recurrence. There seemed, however, to be no tendency toward recurrence. The wire and subcuticular suture were removed on the sixth day; the wound was healed and the deformity was entirely relieved. Both sides of the face presented exactly the same appearance.

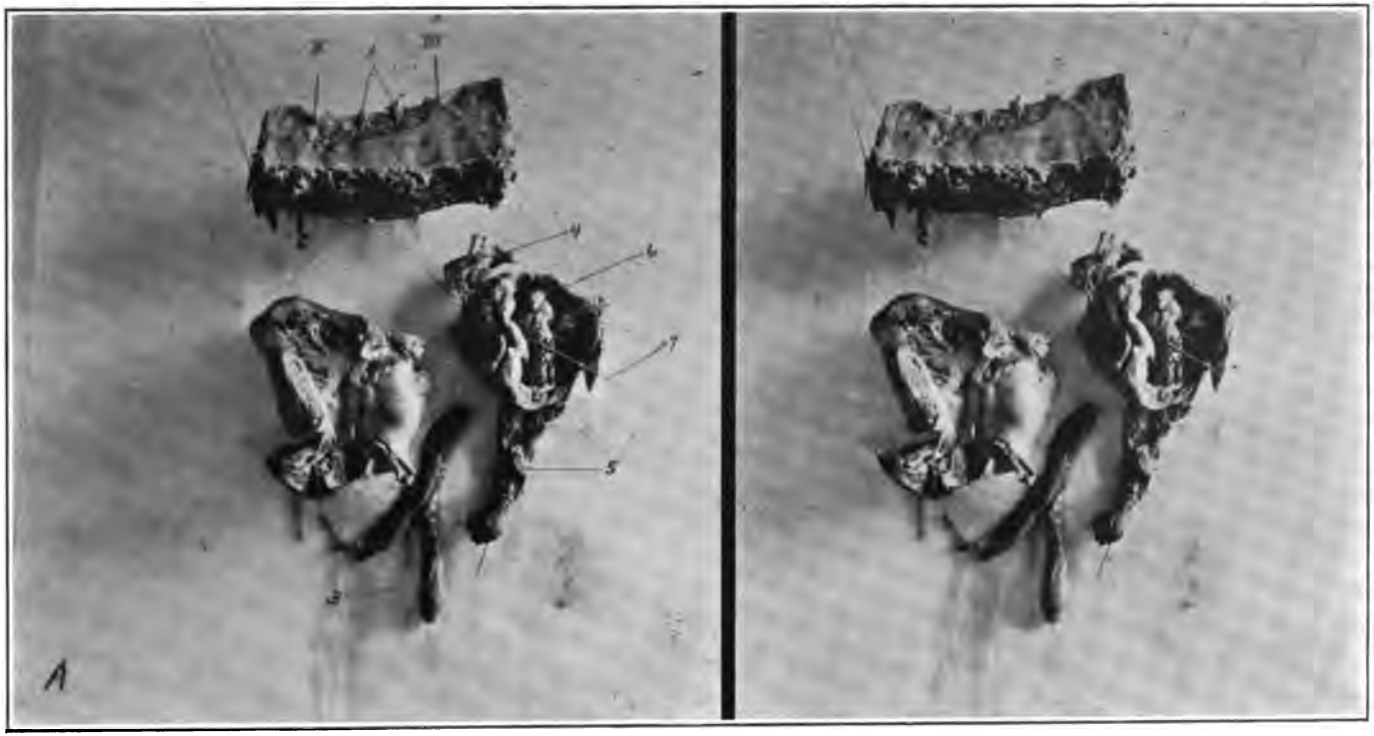
This method of reducing a fracture of the zygoma is that described by Da Costa in his Modern Surgery, and is attributed to Matas.

In the case described above the incision was entirely unnecessary, but at the time it was thought advisable to determine more exactly the nature of the injury before using greater force in efforts at reduction.

DEATH FROM UNRUPTURED THORACIC ANEURISM.

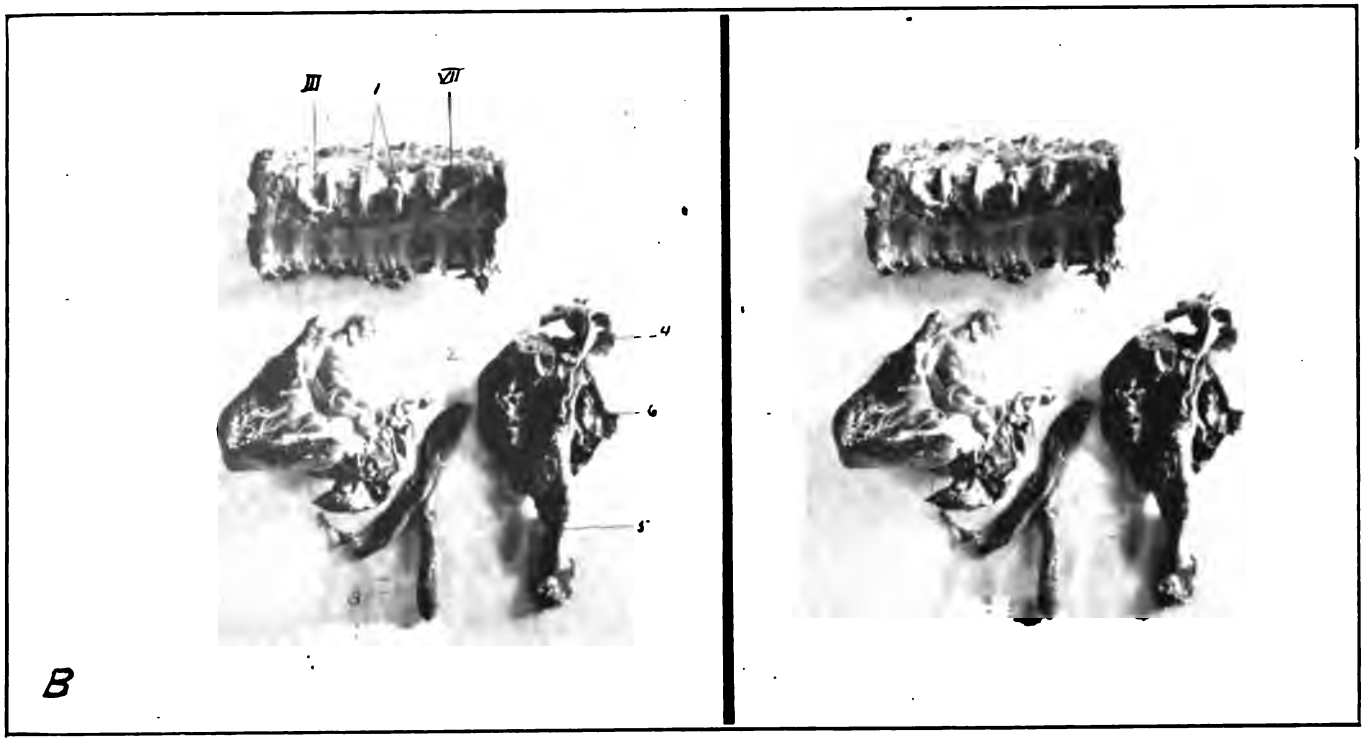
By Passed Asst. Surg. EARLE P. HUFF, United States Navy.

M. J. V., chief boatswain's mate, of Italian parentage, aged 41 years 5 months, was first admitted to the hospital October 4, 1910, with febris æstivo-autumnalis. He had had prolonged service on the Yangtse River, and for several weeks before admission to the hospital had complained of severe pains in the region of his spleen with slight fever, loss of weight and strength, and extreme nervousness. A



DEATH FROM UNRUPTURED THORACIC ANEURISM. SPECIMENS REMOVED AT AUTOPSY.

A. Side view of section of thoracic vertebral column, showing erosion of vertebræ and projection of intervertebral disks. The posterior surface of the aneurismal sac is shown, the opening corresponding to the denuded area of vertebræ, to which it was firmly attached. III–VII, third to seventh dorsal vertebræ, showing erosion; 1, vertebral disks projecting into lumen of aneurismal sac; 2, areas of atheroma on intima of aortic arch; 3, Meckel's diverticulum; 4, arch of aorta, with large branches; 5, descending aorta; 6, wall of aneurism, showing areas of degeneration; 7, bristles passed through lumen of aorta. (Stereoscopic photograph.)



DEATH FROM UNRUPTURED THORACIC ANEURISM. SPECIMENS REMOVED AT AUTOPSY.

B. Front view of eroded vertebræ. Front view of aneurismal sac, showing area of degeneration. III-VII, third to seventh dorsal vertebræ, showing erosion; 1, vertebral discs projecting into lumen of aneurismal sac; 2, areas of atheroma on intima of aortic arch; 3, Meckel's diverticulum; 4, arch of aorta, with large branches; 5, descending aorta; 6, wall of aneurism, showing areas of degeneration. (Stereoscopic photograph.)

clinical diagnosis of æstivo-autumnal fever was made, although the spleen was not enlarged and repeated examinations of the blood failed to show parasites. He was markedly hysterical and displayed typical symptoms, including globus hystericus. Patient was somewhat anemic, but the blood was otherwise negative. (Blood count showed 4,544,000 red cells and 10,000 leucocytes. A differential count showed 62 per cent of polymorphonuclears; small lymphocytes, 19 per cent; large lymphocytes, 14 per cent; large mononuclears, 1 per cent; and eosinophiles, 3 per cent.) Feces and urine were negative. Repeated examinations failed to show anything abnormal in chest or abdomen, and sputum was negative for tubercle bacilli. While in the hospital (10 weeks) patient improved very much in general health, gained in weight, and appeared in normal condition when discharged to duty on December 19, 1910, to take command of one of the Navy ferryboats plying between Cavite and Manila.

One night, shortly after assuming this duty, the ferryboat, of which he had command, collided with a smaller navy-yard craft, sending it to the bottom of the bay and drowning one man. V. is reported to have completely lost control of himself at the time and was relieved on the bridge by an officer passenger. He became extremely nervous, wished to relinquish his command, and was soon again admitted to the sick list with malaria. The blood being found negative the diagnosis was changed to neurasthenia, this diagnosis apparently explaining all the symptoms. He was admitted to the hospital February 11, 1911, with this diagnosis.

His chief complaints were severe pain in the upper part of abdomen, worse after eating, and a "lump rising in his throat, choking him." He also had a marked bronchitis and asthma, with a very severe unproductive cough. All other chest sounds were masked by the asthma. Patient had lost considerable weight and looked decidedly sick. Sputum was white, thick, and tenacious, and contained numerous eosinophiles, but no Curschmann spirals and only an occasional Charcot-Leyden crystal. There were no tubercle bacilli. Urine and feces were negative. Wassermann reaction was strongly positive and the lymphatic glands were enlarged. During the four days in hospital preceding his death the temperature ranged from normal to 100° F., rising to 102° F. just before death. Pulse was from 88 to 120. Respiration from 20 to 30. The cough remained the most distressing symptom, and during the last three days all attempts at swallowing, even water, were prevented by severe coughing paroxysms and apparent spasm of the glottis. Rectal injections were resorted to and the cough controlled somewhat by opiates. During the afternoon preceding death subcutaneous emphysema appeared at the root of the neck, at right side, rapidly increasing until it spread over the entire upper portion of the chest. Venous

congestion was marked and respiration became gradually more difficult until death occurred at 2 a. m. on the fifth day after admission.

Autopsy revealed extensive subcutaneous emphysema, more marked at the base of the neck and upper part of right chest. Extensive old peritoneal adhesions bound down the omentum, spleen, gall bladder, and appendix; mesenteric glands were much enlarged. There was a well-developed (4-inch) Meckel's diverticulum. The inferior vena cava and renal veins were very much distended. On section the liver had a slightly nutmeg appearance. Lesser peritoneal cavity was practically obliterated by adhesions. Spleen normal in size. Very extensive emphysema filled the entire mediastinum and extended out the root of neck to tissues of chest. There was a large persistent thymus. Lungs slightly emphysematous, pleuræ not adherent. Point of exit of air was not discovered but was evidently somewhere in root of right lung. Heart normal but arch of aorta showed numerous patches of atheroma. A moderately large unruptured fusiform aneurism of the thoracic aorta was found, beginning just below the arch, and adherent firmly to the sides of the bodies of the third to the seventh thoracic vertabræ, the eroded surfaces of which formed the posterior wall, the intervertebral disks projecting above the bony surface. The walls of the sac were thin and degenerated in places, and there was considerable pressure on the root of left lung and on the œsophagus.

This case is peculiar in many respects, and several of its features are instructive, although according to Osler it is not uncommon to overlook this type of aneurism until rupture occurs or until autopsy. Its occurrence is rare, Osler reporting only 49 as against 355 aneurisms of the remainder of the aorta (ascending , 159; arch, 113; abdominal, 83). There was complete absence of physical signs, as the chest had been carefully and repeatedly examined for tuberculosis. The extensive erosion of five vertebræ caused no local pain, the referred pain in the abdomen being the only pressure symptom complained of. There was no dysphagia or dyspnœa or other symptom of mediastinal pressure until a few days before death. Very confusing features were the patient's apparent recovery during first admission, the unmistakable symptoms of hysteria, and the attack of asthma near the end. The manner of death was unusual, as these cases almost invariably terminate in rupture; in this case death was undoubtedly due to mediastinal pressure caused by air which escaped from the ruptured lung. The latter resulted from the excessive coughing set up by the pressure of the aneurismal sac on the bronchi. Syphilis was the chief constitutional etiological factor.

APLASTIC PERNICIOUS ANEMIA ASSOCIATED WITH AGCHYLOSTOMIASIS.

By Surg. EDWARD R. STITT, United States Navy.

S. C., N. O. S., Filipino, aged 20½ years. Admitted January 20, 1911, with diagnosis of agchylostomiasis.

Stool examination showed *Trichocephalus* and *Uncinaria* ova; Amœbæ also present.

Blood examination showed a leucocyte count of 4,600 with a differential count of 50 per cent polymorphonuclears, 34 per cent small lymphocytes, 9 per cent large lymphocytes, 3 per cent large mononuclears, and only 4 per cent of eosinophiles. Hæmoglobin was 40 per cent and there were no abnormal red cells. No parasites.

There was possibly anisocytosis of very slight degree. Sputum was negative for tubercle bacilli. Wassermann reaction negative. Tuberculin test negative.

Thymol treatment was given on the third day after admission and 24 worms (*Necator americanus*) were obtained from resulting stools. From this time stool examinations were negative for hookworm eggs.

Subsequent to the thymol treatment patient developed a temperature which reached 103° F. on January 27. At this time he complained of impairment of vision, and ophthalmoscopic examination showed haziness of disk and numerous retinal hemorrhages of venous origin.

At this time blood examination showed 3,200 white cells, 1,570,000 red cells, hæmoglobin 30 per cent, color index, 0.9. The differential count was 35 per cent polymorphonuclears, 34 per cent small lymphocytes, 27 per cent large lymphocytes, 3 per cent large mononuclears, and 1 per cent eosinophiles. There were no nucleated red cells and there was an absence of poikilocytosis.

Patient's temperature fell to normal February 1 and did not rise again during the course of the disease.

On the morning of the day of his death, February 22, the blood count showed only 490,000 red cells and 10 per cent of hæmoglobin. Prolonged search of stained blood smears failed to show a single normoblast or megaloblast.

At autopsy the subcutaneous tissue was found normal in color. The right side of heart was greatly dilated, but otherwise the heart was normal. There was no macroscopical indication of fatty degeneration.

There was some thickening of the capsule of the spleen, and the mesenteric glands were generally and considerably enlarged.

The mucosa of cæcum showed numerous areas of hemorrhage, due evidently to the large number of whip worms present. There was

only one male *Necator americanus* found along the entire length of the small intestine. There were no amœbic ulcerations.

Resection of a rib failed to show the presence of any visible marrow. The right femur was markedly eburnated with a small medullary canal. The marrow was of the consistence of soft butter, had a slight pinkish tinge, and when smeared out on a slide made an oily streak. A particle of this marrow when pressed out under a cover glass looked like a fragment of a lipoma. The consistence of the marrow made it impossible to obtain a mass for fixation and sectioning.

Stained smears from the marrow showed small numbers of lymphocytes and red cells but no nucleated reds or granular leucocytes.

BALANTIDIUM COLI INFECTION ASSOCIATED WITH AMŒBIC DYSENTERY.

By Passed Asst. Surg. G. B. Tribble, United States Navy.

F. H. W., private marine, age 22 years, was on duty at United States marine barracks, Olongapo, P. I. Family history and history previous to his entry into the Marine Corps are negative. He had been employed as a "rubber worker" in civil life, enlisted in the Marine Corps in October, 1908, at Akron, Chio, and came to Olongapo from the marine barracks at Mare Island, Cal.

This patient was first admitted to the U. S. S. *Relief* in June, 1909, with a diagnosis of malaria. Thorough microscopical examinations of his blood failed to reveal the plasmodium, and after an irregular fever of two or three days duration he had no further symptoms. No medicinal treatment was administered other than broken doses of calomel, followed by magnesium sulphate.

In August, 1909, he was again admitted to the *Relief* with a diagnosis of acute intestinal catarrh. At this time he was very weak, was suffering severely from colicky pains over entire abdomen, had from 15 to 30 movements of the bowels daily, had no control over his sphincters, and was under necessity of staying constantly on the bedpan.

The stools were composed chiefly of mucus and blood, and their passage was accompanied by tenesmus. He also suffered from nausea and vomiting. Microscopical examination of the stools revealed many amœbæ, containing red cells and bacteria, also numerous blood cells, and epithelial cells from the intestinal tract. Stained specimens from the stools showed numerous short bacilli, cultures were incubated and what was probably an almost pure culture of *B. coli* was obtained.

Treatment with ipecac preceded by tincture of opium was tried but owing to extreme irritability of the stomach, the ipecac was never retained. Feeding by small quantities of iced milk with lime water, every two hours, and of albumin water every two hours, so

arranged as to give him a small amount of nourishment hourly, was very successful, and the general nutrition was kept up fairly well after the first few days.

Quinine sulphate irrigations (1 to 1,000 solution) were given per rectum, twice daily, about 1 to 1½ liters at an irrigation.

Small doses of opium were given, usually at night for the two-fold purpose of checking the diarrhea and allowing the patient to rest. Some improvement was noted, the diarrhea became less, he no longer required the constant use of the bedpan; his appetite improved and stomach became less irritable. At no time could ipecac be retained. Examinations of the stools were made nearly every day, the amœbæ were constantly present.

On September 20, after the patient had been sick for nearly two months, actively moving bodies were noticed in the fæces. These bodies were about 8 diameters of a red-blood cell wide and 10 or 12 diameters long, and contained a large bean-shaped nucleus, red-blood cells were present in some of these organisms. Stained specimens did not show up well as a rule.

A diagnosis of *Balantidium coli* was made, and specimens were forwarded to Surg. Stitt, United States Navy, who kindly examined them and verified the diagnosis.

Rectal irrigations of hydrochloric acid one-fourth of 1 per cent were commenced.

The condition of this patient showed no permanent improvement under treatment. On liquid or semisolid diet, and rest in bed he would have but few symptoms. Differential blood counts, showed slight eosinophilia at various times. The urine was always negative, with exception of high specific gravity due to concentration.

The patient was finally invalided to the United States naval hospital, Mare Island, Cal.

This infection is worthy of note, first as to prognosis of case, which is of paramount importance to the patient. A high mortality is given to this disease by most observers. When it is taken into consideration that the patient also has amœbic dysentery, with a liability to any of its sequelæ, the outlook can not be considered very promising. As an economic unit he will be practically useless for an indefinite period of time.

From a prophylactic as well as scientific standpoint the question of the origin of the infection will arise. This organism belongs to the family of ciliates, and is the ciliate most frequently found in man. Brauns and other observers agree that this parasite lives in the rectum of the pig and the large intestine of man. It is usually supposed that it propagates by transverse fission, while conjugation and encystment also take place. The infectious stage is that of encystment. In the pig the balantidia cause no symptoms. It is

probable that few symptoms would be caused in man provided the intestinal walls are normal, but any disturbance due to dietetic errors, or disease caused by other organisms, may so lower the resistance that an obstinate if not fatal balantidium infection can follow. The balantidia are very sensitive. In the nonencysted stage movement soon ceases in the relatively fresh specimen. They are also extremely susceptible to acid solutions, very dilute acids killing them. It follows that a normal stomach would prevent living balantidia from passing through it into the intestine. This has been proven experimentally by Grassi and Calandruccio upon their own persons. On animals so sensitive to intestinal disorders as cats, it has usually been impossible to infect them experimentally per os or per anum, unless an entero-colitis had been developed artificially, or the rectum had been made alkaline in reaction.

The man whose case is described above had never had anything to do with the care or handling of hogs, so far as could be ascertained, either in the United States or while on duty in the Philippines.

It is extremely unlikely that the balantidia were present in any number before their discovery; from their size and activity they could not very well have been overlooked. It is probable that the infection existed, but only when the patient's powers of resistance had been lowered did the organism propagate in such numbers as to be constantly present in the feces.

RETURN OF SYPHILITIC SYMPTOMS AFTER ADMINISTRATION OF SALVARSAN.

By Asst. Surg. C. F. Sterne, United States Navy.

R. E. McD., ordinary seaman, serving aboard the U. S. S. *Paul Jones*, reported at sick call April 27, 1911, complaining of sore throat and slight pains in back. Examination of throat revealed several mucous patches on buccal and pharyngeal mucosa. Inguinal and epitrochlear glands were moderately enlarged. A typical syphilitic rash was present on abdomen and back. Temperature normal. There was no lesion visible on penis. Previous history as follows was obtained from patient: Primary lesion was acquired in April, 1910, in Argentine Republic, and manifested itself on corona glandis adjacent to frænum. About two months later the usual secondary symptoms appeared. At this time patient received treatment in form of pills of protoiodide of mercury in usual doses. This was kept up until October, 1910, when patient was transferred to the United States naval hospital, Mare Island, Cal. While there, on November 22, 1910, he received a single dose of salvarsan, the injection having been made in left scapular region. One month later (December,

1910) all symptoms had subsided and, according to patient's statement, he had gained 35 pounds in weight and was apparently in good health. About December 12, 1910, he was sent to duty on board the U. S. S. *Paul Jones*. No symptoms appeared until a few days ago, when typical secondary lesions manifested themselves as stated above.

[A report of the intramuscular injection of 0.4 gram of "606" in this case was published in the Naval Medical Bulletin, volume 5, No. 2, page 175, of April, 1911. Surg. Webb, United States Navy, in his report of the case (case 4), from the naval hospital, Mare Island, Cal., stated that the symptoms cleared promptly, that the Noguchi reaction was negative, and that no recrudescence of the disease had occurred up to the time of the report. The dose was not repeated.

Evidently the dosage in this case was too small, a reinfection with syphilis has occurred, or "606" is not a specific in the disease.

The first conclusion seems to be the probable one.

The case serves to illustrate the necessity for examining the blood at intervals (as is urged by Ehrlich) for the Wassermann reaction, the presence of which is an indication for the further administration of "606."]

A CASE OF SYPHILIS WHICH POSSIBLY DEMONSTRATES THE EFFICACY OF PROPHYLAXIS AGAINST VENEREAL DISEASE.

By Passed Asst. Surg. EDWARD H. H. OLD, United States Navy.

C. A. J., ordinary seaman, serving on board the U. S. S. *North Carolina*, came to sick bay the first part of April complaining of an ulcer on the side of his neck and of enlarged glands in the region nearby.

He gave a history of having had sexual intercourse on February 23, 1911, while on liberty in New York, at which time the woman bit him on the neck; the wound healed in a few days and he did not notice it again until about March 23, a month later, when a small ulceration appeared, which has gradually increased in size. Several smears made from the ulcer were stained with india ink; numerous typical specimens of *Treponema pallidum* were found.

Patient stated that when he returned to the ship, the day after his exposure, he was given the prophylactic treatment. The list on file in the sick bay confirmed his statement. There is no ulcer on his penis.

It is not unreasonable to suppose that the woman had some vaginal lesions and that an ulcer on the penis was prevented by the prophylactic treatment.

The case is also considered worthy of report in that it adds another to the list of syphilitic infections by wounds with the teeth, and illustrates the importance of thorough treatment of such wounds as soon as possible after infliction.

CEREBRAL SYPHILIS IN A NATIVE OF GUAM.

By Asst. Surg. WILLIAM M. KERR, United States Navy.

The patient, a Chamorro, born in Guam, 26 years of age, was first seen July 6, 1910, when he arrived in Guam on a Japanese schooner from Saipan. When examined at the quarantine station he appeared normal with the exception of a marked internal strabismus of the left eye, which according to his statement had existed for two years. On July 15, 1910, he was brought unconscious on a litter to the Maria Schroeder Hospital by some friends, who stated that a few days after his arrival he began to complain of headache and gradually "became more and more sleepy until he could not be awakened."

On admission his pulse was 58, respiration 18, and temperature per rectum 100° F. His breathing was deep with an occasional deeper inspiration, but not stertorous. There was no odor to the breath. There was decided paralysis of the left lower extremity and a weakening of the left arm, forearm, and hand. The pupils were semi-dilated, equal, and reacted to light sluggishly. The patient could not be aroused, but firm pressure over the supraorbital nerves caused movement of the right leg and arm. The deep and superficial reflexes were absent. Physical examination of the heart, lungs, and abdomen was negative. Examination of the blood showed a moderate eosinophilia. The stools contained ova of the hookworm, whipworm, and ascaris. A specimen of urine obtained by catheterization was normal. Shortly after admission he vomited a small amount of mucus.

In view of his age and the gradual onset of the symptoms a tentative diagnosis of brain syphilis was made and a deep intramuscular injection of one-eighth grain of mercury bichloride was given once a day. On July 16 there was no change in his condition. On July 17 he gave evidence of pain when the mercury injection was given. On July 18 he was able to swallow a small amount of liquid and was more demonstrative when the injection was given. Potassium iodide by mouth was now administered in doses of 5 grains three times during the day with a daily increase of 1 grain per dose. On the evening of July 19, with returning consciousness, he gave evidence of headache, and it was observed that his sight was apparently absent or defective. An ophthalmoscopic examination revealed a moderately choked disk in both eyes. From July 20 he improved rapidly. The headache which was general and more marked at night, gradually disappeared. He began to talk and to see surrounding objects more clearly. On July 25 he was able to sit in a chair by his bed. By August 1 he was able to walk about the ward, the paralysis of the left leg and thigh having disappeared. The internal strabismus of the left eye was less marked than when first observed on the schooner, but was still

noticeable. On August 15 he was discharged to his home with directions to continue a mixed treatment which was prescribed for him. He has been observed monthly since his discharge from the hospital and has had no recurrence of his former symptoms.

This case is interesting because the patient had never been away from the islands of Guam and Saipan which have been reported as free from syphilis.

A CASE OF AUTOSEROTHERAPY.

By Passed Asst. Surg. E. O. J. Eytinge and Asst. Surg. L. W. McGuire, United States Navy.

Autoserotherapy as a method of treatment of sero-fibrinous pleurisy, chiefly that of tuberculous origin, was first described by Gilbert and Fede.[1] The authors claim that one injection of the aspirated fluid is usually successful, but that repeated injections up to six may be needed. The quantity injected varies from 1 to 30 cubic centimeters.

While the method is most successful in sero-fibrinous pleurisy, Schnutgen[2] reporting success in 14 out of 15 cases, it is sometimes successful in allied conditions, e. g., hydrothorax, ascites, pericarditis with effusion, etc. In the following case the method certainly accomplished all that is claimed for it.

O. S., first reported sick March 25, 1911. Family and early histories are negative. Onset of present trouble dates back one year. At that time patient was ill for two weeks with a severe bronchitis. He lost weight and recovered very slowly. Since that time he has been in good health until about one week ago, when he began to cough, lose weight, and had pain in chest. Physical examination showed consolidation of right apex and a pleuritic friction rub in right axilla. His temperature was irregular, normal for some days, then rising as high as 102° F. for two or three days. No tubercle bacilli were found in the sputum. A diagnosis of pulmonary tuberculosis was made.

The physical signs grew worse rapidly, effusion was made out, and on April 8, 1,100 cubic centimeters of clear greenish-yellow fluid were removed from right pleural cavity. No tubercle bacilli could be found in the fluid. The cells were nearly all lymphocytes.

Only temporary improvement resulted. On April 12, 1,000 cubic centimeters were removed. Patient improved considerably for a few days then grew worse.

April 22, 800 cubic centimeters of effusion were removed.

April 28, 1,800 cubic centimeters were removed; of this, 20 cubic centimeters were injected into the scapular region. Following this

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[1] Berlin, klin. Wochenschr., Jan. 18, 1909. (Yearbook of Surgery, 1910.)

[2] Deutsche med. Wochenschr., Oct. 21, 1909. (Yearbook of Surgery, 1910.)

treatment the temperature dropped to normal in a few days and remained normal. There was a corresponding change in all symptoms and soon the patient was up and about.

No reaction followed the injection. Physical signs were not clear because of the thickened pleura, and on May 13, the right chest was aspirated but no fluid found. Patient was transferred to the hospital on the following day in good condition.

HÆMOGLOBINURIC FEVER.

By Passed Asst. Surg. DALLAS G. SUTTON, United States Navy.

During the sojourn of the U. S. S. *Des Moines* in west African waters in the summer and fall of 1910 there developed on board seven cases of blackwater fever from the case histories of which the following data have been selected. The etiology and symptomatology of this illness have been very much clouded, and for that reason alone is this article presented, with the hope that some point may be brought out which may be of interest.

Authorities on tropical medicine state that blackwater fever is never contracted by foreigners under six months or a year after moving into the endemic area. In June, 1910, 11 men and 1 officer of the *Des Moines* were sent ashore in search of fresh beef and were away from the ship 36 hours, during which time they slept in a mosquito-infested district. These men had been on the African coast a little over a month, none had been ashore previously at night, and none had a malarial history. Ten days after their return seven men showed malarial symptoms which subsequently developed into those of blackwater fever, three had typical malarial attacks, and two remained normal in health. The men in the party had water and food supplied from the ship. While in Liberia in association with a prominent French military surgeon the writer saw a number of blackwater cases, many of which gave a history of living in the endemic area less than six months. The cases cited may be the exceptions which prove the rule, but this point in the etiology is at least worth investigating further. Careful daily blood examinations failed to reveal parasites in the blackwater cases, but the malarial patients presented a very heavy infection. None of the blackwater cases received quinine in any form previous to the time of exposure.

The symptoms were quite uniform in every respect in all of the cases until the time of the appearance of the hæmoglobinuric urine. Malaise, headache, backache, and loin pain were first complained of, and the onset was typically malarial with chills, fever, and drenching sweats. The primary temperature recorded averaged 105° F., continued with slight daily remissions of a degree or a degree and a half for a week or 10 days. In one or two of the cases the temperature

was very irregular, being high for three or four days, and then dropping to 100° F. or 99° F., only to rise again in the same 24 hours to 103° or 104° F., where it remained until convalescence. In no case did the temperature drop to normal under seven days, and at the onset was the only time when chills and sweats were noted. In every case prostration was marked, and frequent vomiting was a very distressing symptom. The blood-colored urine appeared during the first week and remained for five or six days, during which time pain over the kidney region and bladder caused a great deal of suffering. Microscopical examination of the urine failed to reveal blood cells, and upon standing the fluid became cloudy at the bottom of the beaker and bright red at the top. Icteroid tinting of the skin and sclera occurred in a few cases, as did albuminuria, but these symptoms were by no means general.

The cases all made a good recovery with the exception of one in which albumin and casts appeared in the urine, but this condition had merely the effect of prolonging the convalescence, and the man is now doing active duty. No medicinal treatment of any kind was instituted during the acute illness, and quinine sulphate was not given until the temperature had been normal five days and the kidneys had reacted. Ice baths were given every three hours when the temperature demanded them, and water was given at 15-minute intervals to flush the kidneys. The urine cleared in about five days, and after the fall of the temperature a protracted convalescence was begun. Great loss of weight and anemia remained the only indications of the illness.

SHOCK CAUSED BY LIGHTNING STROKE.

By Passed Asst. Surg. W. S. Hoen, United States Navy.

During a violent electrical storm on December 25, 1910, at Guantanamo Bay, Cuba, a sailboat containing four men returning to the station ship was struck by lightning.

One of the occupants of the boat, a coxswain in the United States Navy, was seated next the mast, which was stepped, and he received the most severe shock. All of the men were rendered unconscious, and three of them were revived by the water filling the damaged boat. The fourth, the coxswain, they discovered floating in the water. Thinking him dead, they placed his body on the thwarts of the boat.

The boat was badly damaged, was almost filled with water which came in through a hole 2 feet long in her bottom, the mast was badly shattered, and the heads of the copper rivets were melted off.

In this helpless plight, with the boat awash, they waited for the storm to abate and assistance to arrive. In about half an hour

the coxswain showed some signs of life, but could not move. The men were in the water for probably two hours before they were picked up and taken to the U. S. S. *Newark*.

The patient when taken to the sick bay presented all the symptoms of profound shock, except that all his muscles were in a state of rigid contraction.

He complained of intense pains over body, especially along the costal margins. The pains were probably due to violent contraction from the electrical shock. He was placed in bed, hot-water bags applied, and about 1,000 cubic centimeters hot normal saline solution injected under the pectorals. In about half an hour reaction set in, the pulse became stronger and slower, and it was then deemed safe to administer a small amount of morphia to relieve the intense pain. From then on the patient steadily improved, though it was four days before he could get out of bed, the spastic condition lasting for that length of time. The patient now presents no symptoms other than an irritable heart. The slightest exertion accelerates the pulse rate to 120 beats per minute.

Patient was returned to duty and is now with the battleship fleet.

AN UNUSUAL CAUSE OF A BURN.

By Passed Asst. Surg. F. M. MUNSON, United States Navy.

J. E. P., electrician third class, was at work in the conning tower of the U. S. S. *Monterey*. Another electrician was using shellac to insulate the ends of the wires entering a junction box. The brush, with which he was applying the shellac, was metal bound and simultaneously came in contact with positive and negative wires which were heavily fused, thereby causing a short circuit with a shower of sparks.

The flame ignited the alcohol vapor of the shellac on the brush and also that in the bottle. This man involuntarily threw the flaming brush and bottle from him. The burning contents of the bottle fell on the arm and forearm of J. E. P., who tried to extinguish the flames with his hand, but was unsuccessful. The burning shellac was finally smothered with a garment. The patient received burns on the right arm, forearm, and hand.

The above case illustrates the necessity for the observance of special care when using metal-bound brushes in the application of shellac about live wires.

TRAUMATIC EXTRUSION OF TESTICLE.

By Asst. Surg. J. A. B. Sinclair, United States Navy.

On January 18, 1911, M. A., an Italian laborer, was following a mountain trail in Alaska when a mass of snow and ice under him became detached suddenly and he was carried swiftly down a steep bank toward a creek 200 feet away.

About 30 feet below the trail a small spruce tree was almost directly in the path of the sliding man. He managed to steer directly into the tree and straddled it with some force, thus checking his fall. He succeeded in scrambling back to the trail and proceeded to his camp about a mile away.

While warming himself before the fire at camp he became conscious of a "queer sensation" in the region of his external genitalia. Dropping his trousers he found that his scrotum was torn. The left testicle was extruded and hanging by the cord below the scrotum. His comrades washed the injured parts with bichloride of mercury solution and suspended it in an improvised jock strap of soiled cotton shirt cloth.

His two companions then started to transport him to Sitka. After walking 2 miles down the mountain to the beach, they attempted to thaw out a small power boat, but the gasoline became ignited and the boat was sunk. They were unable to secure the power boat which makes weekly trips between Sitka and the mine at that place, as that boat was away at the time, consequently they were compelled to camp on the beach for four and one-half days awaiting the return of the boat. The patient was finally brought to the United States naval hospital, Sitka, over five days after the accident had occurred.

Examination showed that the scrotum was ecchymotic, there was a triangular tear, through which the testis and epididymis with an inch of cord protruded, covered with coagulated blood. There was no evidence of infection. The edges of the wound had united around the cord.

The testicle, cord, scrotum, and contiguous parts were painted with tincture of iodine without previous washing, a sheet of rubber tissue wrapped around testicle and cord, dressing applied, and the whole placed upon an adhesive plaster bridge.

At 10 o'clock next morning, January 24, 1911, the patient was etherized, the field of operation was repainted with tincture of iodine, the edges of the scrotal wound dissected away from the cord, one of the angles extended half an inch and the testicle was replaced in the scrotum, after carrying an anchor suture of chromic gut through the capsule of the testicle, up along the cord, and out through the upper third of the scrotum anteriorly, tying the ends over a piece of gauze.

The edges of the scrotal wound were then approximated with chromic gut after inserting a rubber tissue drain from high up along the cord. The drain was withdrawn next day, the anchor suture on the fifth day, and on the seventh day after operation the patient was up and able to walk around the ward, practically primary union of the skin having occurred.

On February 2 the patient was discharged. The next day the accompanying photograph was taken, showing the result of the operation. The patient felt quite comfortable and left Sitka on February 8 to be married.

One interesting fact in connection with this case is that infection failed to occur despite the opportunity for it to do so. He was exposed to a temperature ranging between zero and + 10° F. for five days. His wound was covered with a nonsterile dressing, but was doubtless protected by the coagulum. The still more interesting question of the manner of occurrence of the extrusion presents itself. The man's trousers were not torn, neither were they opened until the man unbuttoned them in camp. No sharp or cutting object was in the course of the man's slide, so that it is reasonable to suppose that the force of impact against the tree was exerted in an explosive manner upon the testicles and scrotum, and in that way caused the laceration of the scrotum with the "popping out" of the testicle.

TRAUMATIC EXTRUSION OF TESTICLE. RESULT AFTER OPERATION.
SEE PAGE 355.

CURRENT COMMENT.

[It is to be remembered that in the publication of these comments the bureau does not necessarily undertake to indorse the opinions expressed, but will lend the pages of this section to discussion of such contemporary topics as will be of interest and value to the service.]

CRITICISMS AND SUGGESTIONS RELATIVE TO THE HEALTH RECORD.

The method of keeping the individual health record has become so generally well understood that comparatively few have had to be returned for correction.

The most frequent error is the omission of entries indicating that the service of the individual has been terminated or, in the case of officers, that a promotion has occurred.

In the absence of such entries it becomes necessary to establish this fact before filing the record.

Entries relative to discharge or desertion should be made in the proper place and not on the medical history leaves, which are for the indicated purpose only.

Transfers from the command of men not at the time on the sick list should be entered under the abstract of health only.

When an officer is detached, on leave, or waiting orders, or is ordered to duty where there is no medical officer assigned, the record should preferably be forwarded to the bureau with a statement of the circumstances.

If given to the individual concerned, unforseen conditions might arise, such as a severe illness or injury, and all trace of the record might be lost.

The failure of a health record to accompany an officer or man should never result in neglect to make a record of the case, which record may be either entered in a new record or on extra medical history leaves, to be subsequently attached to the original record or forwarded to the Bureau of Medicine and Surgery.

It appears customary in many naval hospitals to discharge a case (I. S.) from the hospital records. There appears to be no objection to this procedure, which saves clerical work, provided any further unforseen admissions to and discharges from the sick list are correctly indicated.

In a recent case the patient was readmitted (R. A.), transferred back to the hospital from which he was erroneously again discharged,

(I. S.) thus duplicating this entry. The use of (T) transferred is suggested to avoid this complication.

Under circumstances rendering the transportation of the individual health records unadvisable, as in an expedition ashore, it is suggested that extra medical history leaves be inserted between one or more record covers and that the entries for each individual be made on separate sheets, to be inserted subsequently in the original record or forwarded to the Bureau of Medicine and Surgery.

Owing to a stress of work in the bureau it has been found impracticable at present to forward all abstracts of former health records of reenlisted men. If medical officers will forward to the bureau a list of such men of the command as have been discharged and reenlisted since the adoption of the health record, and whose records are incomplete, the abstract will be supplied.

DISTINGUISHED HONORS CONFERRED.

Surg. Gen. Charles F. Stokes, United States Navy, has been made the recipient of unusual honors recently.

The board of trustees and faculty of Jefferson selected him to deliver the address at the commencement exercises of that institution, at the Academy of Medicine in Philadelphia, on June 5.

On this occasion the degree of LL.D. was conferred upon him by the board of trustees, with unanimous approval of the faculty of this conservative institution.

His alma mater, Columbia University of New York, has just conferred upon the Surgeon General the degree of Sc.D., on the occasion of the recent commencement exercises of that institution.

THE CLOSING EXERCISES OF THE NAVAL MEDICAL SCHOOL.

The graduating exercises of the United States Naval Medical School, Washington, D. C., were held on March 23, 1911, at 11 o'clock.

Chaplain G. L. Bayard, United States Navy, pronounced the invocation, which was followed by an address by Medical Director Henry G. Beyer, United States Navy, president of the school.

Surg. Gen. C. F. Stokes, United States Navy, then presented the diplomas to the members of the graduating class.

Dr. Robert Tuttle Morris, professor of surgery in the New York Post Graduate Medical School and Hospital, delivered an eloquent address. He was followed on the program by the Surgeon General of the Navy, Dr. C. F. Stokes, who made an excellent address, full of interest to the class and to the audience.

The program was closed by the benediction pronounced by Chaplain Bayard.

The following is a list of members of the class in the order of their standing in the class at graduation:

1. Asst. Surg. Edward Peter Halton, United States Navy, of New York.
2. Asst. Surg. Arnold Leon Jacoby, United States Navy, of Illinois.
3. Acting Asst. Surg. Edward Elias Woodland, United States Navy, of Texas.
4. Asst. Surg. John Joseph O'Malley, United States Navy, of Pennsylvania.
5. Asst. Surg. Clarence Cameron Kress, United States Navy, of Missouri.
6. Asst. Surg. William Edward Eaton, United States Navy, of Massachusetts.
7. Asst. Surg. Lester Leslie Pratt, United States Navy, of Ohio.
8. Asst. Surg. Jasper Victor Howard, United States Navy, of North Carolina.
9. Asst. Surg. Robert Francis Sheehan, United States Navy, of New York.
10. Asst. Surg. William Howard Halsey, United States Navy, of Wisconsin.
11. Acting Asst. Surg. Oliver Joseph Miller, United States Navy, of Florida.
12. Asst. Surg. James Gibson Omelvena, United States Navy, of Arkansas.
13. Asst. Surg. Daniel Delehanty Stuart, jr., United States Navy, of District of Columbia.

PROGRESS IN MEDICAL SCIENCES.

GENERAL MEDICINE.

Surg. A. W. DUNBAR and Passed Asst. Surg. J. L. NEILSON, United States Navy.

CANTLIE, J., M. D. **Plague in Manchuria and Its Lessons.** Journal of Trop. Med., Feb. 15, 1911.

The writer invites attention to the possibility that the focusing of attention on the transmission of plague by fleas may cause a lack of recognition of a more alarming source of infection. The pneumonic form of this disease is admittedly directly contagious from man to man, and the bubonic variety may be similarly transmissible. The present epidemic in northern China is the first of recent date in which pneumonic plague exists in a severe form to an almost complete exclusion of the bubonic type.

Cantlie is of the opinion that the so-called climatic bubo of the Orient, which occurs frequently among the seafaring class, is due to infection by a special variety of the *Bacillus pestis* of slight virulence which is termed "pestis minor" by the author. In 1893, preceding the outbreak of the great epidemic in India and China, numerous cases of "climatic bubo" were reported. These cases assume greater virulency as time goes on. The possible stages of plague infection may be classified as (1) pestis minor, (2) bubonic plague, (3) pneumonic plague. These varieties are undoubtedly related, the flea, rodents, and man constituting the connecting links. Animals, chiefly rodents, appear to be primarily infected. In Manchuria, the rodent (*Arctomys bobac*) has been infected for the last 12 years and sporadic outbreaks of bubonic plague have occurred in man. In the present epidemic, it is interesting to note the varying manifestations of the disease in three centers. In Siberia, it is endemic, bubonic in type, and transmitted by the flea from rodent to man. The mixed bubonic and pulmonary type obtains in Mongolia, while in Manchuria the pulmonic type exists to the practical exclusion of the bubonic form, and is directly transmissible from man to man. China and India having been harboring the disease in rodents for years, and sporadically in man, appears ripe for a serious epidemic.

In the United States a similar condition exists through the infection of the ground squirrel, which may continue for years and then suddenly an epidemic in man may occur.—(A. W. D.)

SKINNER, C. E., M. D., LL. D. **The Treatment of Arthritis Deformans.** American Jour. of the Med. Sci., Nov., 1910.

The author considers this disease of great importance as, in its "capacity to make its victims miserable, helpless, and hopeless it is unexcelled by any condition with which we come in contact" and it is not as uncommon as is generally supposed.

Although this paper deals with treatment the writer gives briefly some points as to diagnosis. Arthritis (according to his view) "should be strongly suspected when the following conditions obtain: (1) Whenever a case of joint inflammation presents simultaneous involvement of corresponding joints on both sides of the body. (2) Whenever the maxillary articulation is involved. (3) Whenever the joints of the fingers or toes are involved. (4) Whenever muscular atrophy accompanies the outbreak. Rheumatism will sometimes produce atrophy of the controlling musculature by compelling disuse of the joint, but this takes place in the later stages of the disease. In arthritis deformans the atrophy frequently precedes the joint outbreak. (5) Whenever a case is accompanied or has been preceded by local sweats, local syncope, or local asphyxia of the parts affected or of the corresponding parts on the other side of the body when but one side is frankly diseased. (6) Whenever trophic or pigmentary changes are apparent in the skin over or in the neighborhood of the affected joints, in the clavicular regions or on the outer aspect of the forearms or lower legs. (7) Whenever a patient gives a history of having had for some time preceding the outbreak, stiffness or soreness of joints immediately after wakening in the morning, which disappears after using the joints a little. (8) Whenever a case of "stiff neck" proves resistant to ordinary methods of treatment. (9) Whenever a case of apparently rheumatic joint inflammation resists thorough salicyl medication vigorously exhibited for more than a week."

So far as etiology is concerned the author gives four theories: "(1) That it is a pure and simple trophoneurosis; (2) that it is a pathological infection; (3) that it is an autotoxæmia; (4) that it is one of the ultimate expressions of depressed cerebrospinal function which may be precipitated by any sufficiently profound systemic toxæmia, infectious, intestinal, or metabolic."

Based on the views regarding etiology the treatment as far as combating the disease process, per se, is concerned, is essentially identical for all four theories: (1) To close possible avenues of infection such as local suppurative, ulcerative and catarrhal processes, carious teeth, etc.; (2) to improve the general and local nutritional processes; (3) to accelerate the elimination of katabolic products and toxins, and (4) to limit the formation of autotoxins. Added to these are the relief of

pain and the management of the affected joints. Each case should receive careful individual adaptation of these measures.

Under physiological therapy the author deals with: (1) Dry hot air (350°–400° F.) to the general body surfaces; (2) electricity (spark and wave current from a static machine); (3) Hydrotherapy (hot and cold douche from hose); (4) mechanical vibratory stimulation to the spine; (5) dietary regulations. With regard to drugs, it is the writer's opinion that no substance has as yet been offered that produces a curative effect. Alteratives and tonics are of value to favorably affect general and local metabolism. Thyroid extract seems to be beneficial and this suggests the possibility that the disease is the result of aberrant function of ductless glands. The salicylates produce their effect, apparently, by relieving pain and swelling and from the fact that arthritis deformans is not infrequently associated with acute articular rheumatism.

Alcohol and tobacco tend to aggravate the condition.—(J. L. N.)

ADDIS, T. **Hereditary Hæmophilia: Deficiency in the Coagulability of the Blood the Only Immediate Cause of the Condition.** Quarterly Jour. of Medicine, Oct., 1910.

The author first discusses theories held in regard to this condition. Then at some length deals with the coagulation time in certain cases of hæmophilia, giving comparisons with normal blood. He quotes briefly Mellanby's theory of coagulation as follows:

The circulating blood contains fibrinogen with its absorbed prothrombin, calcium salts, and antithrombin. No coagulation takes place because of the absence of thrombokinase. When the tissues are wounded, the injury or destruction of the cells leads to the setting free of thrombokinase. In its presence the calcium salts unite with the prothrombin, and thrombin is formed. On account of the close molecular relation which exists between this newly formed thrombin and the fibrinogen, it escapes the neutralizing action of the antithrombin, and fibrin is quickly formed by its action on the fibrinogen. Most of the thrombin is precipitated with the fibrin. Any fresh blood forcing its way through the clot is coagulated by thrombin, prothrombin being thus set free, but if no thrombokinase reaches it no fresh thrombin is formed. The production of thrombin is, therefore, strictly limited to the sphere of the thrombokinase.

That part of the thrombin which is not carried down by the fibrin is slowly neutralized by the antithrombin. The whole mechanism of coagulation is admirably adapted to produce large and rapid clotting within the wounded area, but to stop the process immediately beyond the confines of the injured tissue.

He reaches certain conclusions based upon his work and Mellanby's theory of coagulation:

1. There is a deficient coagulability of the blood in each case examined.
2. The degree of the defect in coagulation corresponds with the degree of the severity of the clinical symptoms.
3. The coagulation of blood flowing from a wound is induced by thrombokinase added to it from the tissues and the rapidity of coagulation varies directly with the amount of thrombokinase. Much larger quantities of thrombokinase are required to

produce rapid clotting in hæmophilic than in normal blood. In a wound, in a hæmophilic, coagulation may, therefore, only occur in those parts where the concentration of thrombokinase is highest—i. e., on the sides of the wound. But the clot prevents the addition of further quantities of thrombokinase from the tissues, and when the amount of thrombin liberated from the primary clot is insufficient to lead to the complete coagulation of the blood in the center of the wound, bleeding may continue indefinitely.

4. Hemorrhage is no more easily induced in a hæmophilic than in a normal person. The distinction is not in the occurrence but in the amount of bleeding.—(J. L. N.)

EDSALL, DAVID L., Prof. **Discussion of Acidosis.** British Med. Jour., Oct. 8, 1910.

The author compares the great simplicity of the subject when it first came into prominence with the present complexity, which has resulted from the vast amount of work that has been done along this line. He deals mostly with the physiological side of the question. It is clearly understood that acids, as such, experimentally used are capable of producing a somewhat peculiar train of symptoms when ingested in large amounts and that the organism meets their presence by using an available alkali that is not essential for other purposes, namely, ammonia. The result is an excessive excretion of ammonia in the urine, and therefore abnormal amounts of ammonia in the urine become the index of the extent of acid intoxication. We also know that similar circumstances obtain in certain pathological conditions of the human being.

We may say without question that β-oxybutyric acid has a large share in producing the intoxication that occurs in diabetes and occasionally in other conditions, and that its acid effects are an extremely important factor in the intoxication, although we have to admit that other causes, such as autolysis, probably act in a considerable proportion of instances together with the acid intoxication, and the author suggests that the toxæmia may result not solely from the excess of acid as such, but from the fact that the acids favor additional autolytic tissue change. The lack of favorable action of alkalies so frequently seen in cases of this disorder could then be explained by the fact that the autolytic changes and the very complex intoxication that must be associated with them have become so pronounced that the acids play but a minor rôle.

The author expresses the belief that there is nothing concrete to be said as yet about acids other than β-oxybutyric, although much work is being done with them.

He then discusses the question as to the manner in which the acids produce their effect, of which so little is known, and completes his paper by dealing with the question, "In what manner does the large accumulation of acid occur?" and "How far are we advanced toward controlling this accumulation?" The main cause of the

accumulation of the fatty acids has been demonstrated to be a lack of ability to use carbohydrates or a lack of carbohydrate food in the diet, and especially the consequence of this, which is the use of a large amount of fat in the food or a consumption of a large amount of body fat in order to make up the deficiency. He gives the two possible explanations. Either the organism is overtaxed in the powers of utilizing fats because of the large demands that are made upon fat metabolism or some interaction occurs normally in the combustion of carbohydrate and fat and in the lack of the former the latter is not probably burned.

The hope that, ultimately, successful treatment will be realized seems to lie in the attempt to provide a practical substitute for sugar-yielding foods.—(J. L. N.)

SURGERY.

Surgs. RAYMOND SPEAR and EDGAR THOMPSON, United States Navy.

THOMAS, T. T. **Laceration of the Axillary Portion of the Shoulder Joint as a Factor in the Etiology of Traumatic Combined Paralysis of the Upper Extremity.** Annals of Surg., Jan., 1911.

From his own experience in a limited number of cases, and from a study of reported cases in the literature, the author reaches the following conclusions:

Extensive laceration of the axillary portion of the capsule of the shoulder always occurs in anterior dislocations of this joint, which represent practically half of all the dislocations of the body. Probably, while the arm is in forced abduction, many others occur, which are spontaneously reduced as the arm falls by gravity to the side of the body immediately after the accident, and the fact of their occurrence is never recognized. Just as the milder lesion, the sprain, is more common at the ankle and wrist than the fracture, which results from a similar but more severe force, so, in all probability, are the sprains at the shoulder more common than the dislocations. We can thus account for a large number of cases in which the same capsule tear occurs.

The extravasation of blood, lymph, and synovial fluid, resulting from such a lesion, falls by gravity into the loose tissues of the axilla, where they surround and infiltrate some or all of the branches of the brachial plexus, giving rise to a noninfectious inflammation, which adds to the already existing compression of the nerves and induces a perineuritis and neuritis. The interference with the function of the nerves caused by these conditions can account for the multiplicity of the nerve symptoms and the fugaciousness of certain symptoms, so that one need not assume the existence of a traumatic lesion of the brachial plexus, its roots, or its branches to account for them.

The infantile obstetrical palsies, in which one or both upper extremities are involved, may be the result of a similar axillary condition. This implies that forced abduction of the arm, with or without traction on it, and not traction on the head, is the important causal factor. Dislocations at birth give rise to similar palsies, and in these capsule tears undoubtedly occur. The palsies associated with these dislocations are probably completely curable by the recognition and reduction of the dislocations soon after birth.

We may have in unrecognized capsule tears the pathological explanation of many craft palsies. In this connection they at least deserve further consideration.

In traumatic brachial paralyses in adults, in infantile obstetrical, and in craft palsies, the shoulder joint should be examined for a traumatic lesion, and if evidence of it is discovered, such as scapulohumeral limitation of movement, the first therapeutic efforts should be directed toward obtaining a return of normal motion in the joint.

Operations on the brachial plexus, its roots, or its branches should be deferred until a paralysis from inclusion of the nerves in cicatricial tissue has been eliminated.—SURG. J. F. LEYS.

BEVAN, ARTHUR DEAN. **Tuberculosis of the Kidney and Ureter.** Surg., Gyn., and Obstet., Apr., 1911.

The subject of tuberculosis of the kidney is now receiving a great deal of attention. So short a time ago as 1877 Ebstein referred to the condition as always being fatal within a year. In 1885 before the Congress of Surgeons in Germany Fisher made the statement that any radical operation for kidney tuberculosis was not warranted. In 1891 Madelung collected 60 cases of nephrectomy for tuberculosis of the kidney with 11 deaths.

Clinically the primary lesion is in one kidney; it is almost always secondary to some small obscure lesion, such as a lesion of the cervical or bronchial glands, and from this original lesion a hæmatogenous infection of the kidney occurs. In some cases the kidney lesion is a mere incident in an overshadowing general tuberculosis. The infection of one kidney by the hæmatogenous route is comparable to the unilateral hip tuberculosis. An ascending kidney infection from the genital tract is probably very rare. Tuberculous kidney, perhaps, always results from an infection through the blood stream.

Bevan believes that in the beginning 90 per cent of the cases are unilateral at first. Post-mortem studies show many double lesions, but this is to be expected for the picture is at the terminal stage of the process, and in all probability the sound kidney has been infected by the hæmatogenous route.

The cases usually start with the involvement of one kidney, then involvement of the ureter and bladder, and, finally, general tuberculosis results. Some cases, however, go on to a spontaneous recovery.

Not infrequently post-mortem examination reveals a kidney totally destroyed, nothing remaining but a caseous mass surrounded by a dense fibrous mass, showing a pathologic nephrectomy.

The author firmly believes that some cases of kidney tuberculosis go on to complete recovery as in the pulmonary cases. These are not frequent, but three or four such cases have come under the immediate care of Dr. Bevan.

In cases of beginning tuberculosis of the kidney frequency of micturition is the principal symptom, there is a little pus in the urine and 25 to 30 per cent of the cases will show a little blood. Pain is rather characteristic; in many cases there is an aching sensa-

tion sometimes fairly painful in the back and running along Poupart's ligament. Plugging of the ureter with blood or débris may cause a distinct renal colic. The later symptoms show the evidence of a tuberculous process by loss in weight, evening temperature, weakness, etc. A tumor is a late symptom and may mean a perinephritic process or a compensatory hypertrophy of one kidney following a total destruction of the other. Warning is given at this point when the question of a nephrectomy is considered that a good deal of kidney tissue usually means compensatory hypertrophy and destruction of the other kidney.

The differential diagnosis is one of the most interesting that confronts the surgeon; it must be made from an infection of the kidney from other causes, as a pyelitis from the colon or other pus organisms, from congenital cystic kidney, essential hæmaturia, but especially should be excluded neoplasms and stones. As a rule this is simple and can be decided by a careful examination of the urine microscopically and chemically. In the majority of cases of kidney tuberculosis the tubercle bacilli can be demonstrated by persistent search. Stones can be outlined definitely by X-ray examinations. Cystoscopic examination is very important. Willy Meyer's description of how a kidney tuberculosis stamps the area around the ureter is very graphic. It does in almost all cases show its presence by the little ulcerations and tubercles on the infected side. Bevan does not trust the segregator, but advises always examining the catheterized urines from the right and left sides obtained with the ureteral catheter.

Where a definite unilateral tuberculous lesion of the kidney without any gross or evident tuberculous lesion elsewhere can be demonstrated and if the patient is a good surgical risk, Bevan advises an early nephrectomy.

It is always well to discuss kidney tuberculosis under two heads, medical management and surgical treatment. The medical treatment here is just as important as it is in any surgical tuberculous condition. For instance, to-day the medical treatment of tuberculosis of the epididymis is by far the more important. In tuberculosis of the kidney hygienic management the same as given in lung cases means much.

In discussing the value of tuberculin, Bevan states he has seen three or four cases recover, but the hygienic treatment was also used, so the exact value of the tuberculin could not be determined. In cases of bilateral infection it is better by far to experiment with tuberculin and use hygienic measures than to resort to surgery for renal tuberculosis can be cured without operation.

As to the surgical treatment, after having determined that only one kidney is involved an oblique incision is made to obtain a wide

exposure, it is never necessary to resect any ribs. If no perinephritic process has occurred the kidney is easily delivered and the vessels and ureter are ligated separately. This procedure is not always possible if there is tuberculous tissues about the ureter, sometimes it is better to ligate en masse. Wherever possible the vessels should be ligated separately and the diseased ureter brought out at the angle of the wound. To remove the whole ureter is bad surgery, for the tuberculous infection of the ureteral mucous membrane clears up after removal of the primary focus, just as bladder tuberculosis heals on removal of the tuberculous kidney.

It is advised to inject the ureter with alcohol not only at the time of the operation but at regular intervals afterwards.

In cases where there is a perinephritic process, Bevan believes it is better not to attempt to remove the capsule, but to split it and remove the kidney without the capsule. Ligation of the vessels is difficult, but they can always be clamped and the clamp can be left on for 24 hours. The wound can then be packed with iodoform gauze.

As to nephrotomy and resection; resection has no place in the surgical treatment of tuberculosis of the kidney. In practically all the cases of nephrotomy it was necessary to perform a nephrectomy later, and these operations are more difficult than the primary nephrectomies.

As to the end results, the majority recover permanently; probably 40 or 50 per cent succumb to tuberculosis either extending from a primary kidney focus or from a general tuberculous process. Almost all of the infected bladders in these cases recover within three to six months, but some cases of bladder tuberculosis continue to a fatal termination despite any treatment.—(R. S.)

PILCHER, PAUL M. **Injuries to the Kidneys with End Results.** Surg., Gyn., and Obstet., Feb., 1911.

Reference is made to Kuster's experiments to show that a kidney is not easily ruptured unless filled with fluid, but that if the vessels be injected and the pelvis filled with fluid moderate violence will produce extensive laceration. Kidney rupture has occurred in life from muscular effort alone.

A given case may be uncomplicated rupture of one kidney alone, or rupture of both kidneys, or rupture of kidney complicated by injury of some other abdominal viscus, spleen, liver, gall bladder, intestines, bladder, etc.

In the 562 cases collected by Watson, there were 190 deaths, hemorrhage causing 80, suppuration 41, anuria 34, shock 24. The results of treatment were:

Treated expectantly.—Uncomplicated, mortality 29 per cent; complicated, mortality 91 per cent.

Treated operatively.—Uncomplicated, mortality 18.3 per cent; complicated, mortality 44 per cent.

Pilcher considers that 80 deaths from hemorrhage in this series is sufficient proof that operation was delayed too long. Hemorrhage considerable in amount, or persisting in small amount for more than two days, he considers an absolute indication for operation. In operating it should be remembered that blood from the kidney does not appear in the urine unless the renal pelvis or one of its calices has been injured, therefore in operation for persistant hemorrhage the kidney should be split from pole to pole and the pelvis explored.

Evidence of free blood in the peritoneal cavity complicating renal injury calls for abdominal section. Perinephritic abscess calls for incision and drainage, pyelonephritis for nephrectomy, peritonitis for abdominal section. Anuria may be due either to reflex nervous disturbances or blocking of the pelvis and ureter by blood clots. In either case operation may relieve the condition.

He summarizes his conclusions as follows:

1. The expectant treatment is indicated in cases of slight injury to the kidney in which there is only moderate or transitory hemorrhage of short duration.
2. Operation is contraindicated where both kidneys are extensively injured.
3. Operation is strongly advised where there is progressive, recurrent, or persistent hemorrhage. Also when infection has taken place.—SURG. J. F. LEYS.

ALEXANDER, E. G. **Fracture of the Patella.** Annals of Surgery, Apr., 1911.

In studying 56 cases of fracture of the patella, 49 of which were operated upon, Alexander advocates the operative or open treatment.

A majority were of the transverse variety with the large fragment above. In cases treated conservatively, nothing but fibrous union occurs, and the results are inferior to those obtained by the open method of treatment. Especially is this true in young and healthy subjects, who are good operative risks.

The best time to operate, he says, is after all oozing has ceased, and the exudate is no longer increasing in amount. The synovial membrane has then reacted to the trauma and the irritation of the blood clot. This reaction produces a cofferdamming of the lymph spaces in the subendothelial layer of the synovial membrane and lessens the danger of infection.

He advocates the elliptical incision, convexity downward, clots are swabbed out with dry gauze, and no fluid is used in the joint, if possible.

He prefers to use silver wire to hold the fragments of bone together and chromic gut for the torn fibrous expansion of the tendon, the fascia, and the joint capsule. Drainage is made with a few strands of

silkworm gut at the angles of the wound. Comminuted fractures with great displacement of the fragments are treated by the open method. When the fragments are separated by effusion or clots, the joint is opened, clots turned out, fragments adjusted, and the capsule is well sutured with chromic gut. In badly infected cases at or following operation, early free incision and packing with iodoform gauze gives the best results.

A well padded slightly convex posterior splint is applied until the patient is completely recovered from the effects of the anæsthetic, or occasionally the splint is not removed until after the first restless night following operation. The leg, slightly flexed is then placed on a pillow. Gentle passive motion is begun on the third day, moving the leg through an angle of 5° to 10° without much movement or strain on the patella. This is carefully continued until at the end of three weeks the leg can be flexed to a right angle. The patient is allowed to get out of bed as soon as possible. He asserts that it is a mistake to keep the leg for weeks on a splint or in a cast. It means loss of time for the patient, atrophy of the muscles of the injured leg, and more or less stiffness of the joint.

When silver wire has not been used and absorbable suture material has, passive motion must be delayed and convalescence is prolonged.

In those cases which, for one reason or another, it is not advisable to operate, the method preferred is that devised by the late Dr. Agnew.—PASSED ASST. SURG. R. W. McDOWELL.

MOYNIHAN, B. G. A. **Acute Emergencies of Abdominal Disease.** Br. Med. Jour., Apr. 1, 1911.

In an address on this subject before a section of the British Medical Association, Moynihan dealt particularly with those abdominal emergencies which have to do with (1) acute appendicitis, (2) perforation of gastric or duodenal ulcer, (3) acute pancreatitis, (4) rupture of tubal gestation, (5) gallstone colic.

Concerning appendicitis, the points he emphasizes are that any case in which pain is not the first symptom is not a case of appendicitis; that the bacterial content of the ileocæcal region is greater than that of any other portion of the alimentary canal, and the stimulus of food, drink, or catharsis increases the number and virulence of the bacteria in this region; that starvation is an imperative feature in the early expectant treatment; that catharsis is reprehensible; that, in his opinion, perforation with rapidly spreading peritonitis is usually caused by purgation and the disease thus "derives its fiercest activities from the means which are taken to treat it." He says, "If the surgeon, when he is called in consultation, hears that a purgative has been given, that alone should, in my judgment, decide him to advise an immediate operation."

Concerning perforating duodenal ulcer, it is stated that at the moment when perforation occurs there is "agonizing and unendurable pain," with inability to move, and a condition of inflexible rigidity in the abdominal muscles, especially in a limited area directly over the lesion, though the pulse may remain practically normal in rate and volume for some hours following. Such a condition of the pulse at this time must not mislead the surgeon into postponement of operation. The pulse increases in frequency and depreciates in value very soon, but this is due to the peritonitis which is the inevitable sequel.

Of acute pancreatitis, which is not so uncommon an affection as was once supposed, Moynihan has operated on 11 cases, of which the last six in succession and one other have recovered. The pain is of sudden onset and agonizing severity, is confined to the upper portion of the abdomen, and runs through to the back. Muscular rigidity is usually confined to the upper part, the lower abdomen being more or less flaccid. Vomiting is an early symptom, and there is early and profound collapse suggesting imminent death.

The only other abdominal emergency with profound collapse and instant lowering of the blood pressure is rupture of a tubal gestation. This usually presents no difficulty of diagnosis.

The crises that develop in cholelithiasis are rare. In more than a thousand gallstone cases he has seen only two ruptures, three acute phlegmonous cases, and one of gangrene with perforation.

Emphasis was laid on the conclusion that—

The occurrence of a sudden attack of intolerable agony in the abdomen, associated with tense rigidity of all the abdominal muscles, indicates that there is an acute lesion which needs immediate surgical attention. These two signs, and these alone, are an urgent warrant and compulsion to us to treat the case at once by operation.—SURG. J. F. LEYS.

MAYO, CHARLES H. **Intestinal Obstruction Due to Kinks and Adhesions of the Terminal Ileum.** The Jour. of the Minnesota State Med. Association and The Northwestern Lancet.

The stomach suffers many reflex conditions, but only 1 patient in 10 with gastric symptoms shows actual lesions. Many bowel conditions, as obstruction, appendiceal concretions, etc., simulate symptoms of ulcer.

Development of the middle intestine includes from below the common duct to, and including part of, the transverse colon. Ten inches of the ileum is pelvic, was originally fixed to the cæcum, and becomes detached at birth except for a lateral opening. When this fails to take place obstruction is more liable to occur.

In extensive appendiceal operations in cases with obscure symptoms, Abuthnot Lane has noted an intestinal kink near the ileocæcal

valve. He believes this causes obstruction, often noninflammatory, and probably resulting from traction of the loaded cæcum.

The symptoms often simulate those of appendicitis, ulcer, and various forms of constipation.

Many cases of this nature have been seen, both inflammatory and noninflammatory, and producing reflex symptoms. Therefore, with the present increased facilities for intestinal exploration, the four terminal inches of the ileum should be examined, when possible, in obscure cases of digestive disturbance.—(R. S.)

RUBIN, I. C. **The Functions of the Great Omentum.** Surg., Gyn., and Obstet., Feb., 1911.

From studies on the cadaver, notes of 100 autopsies on the fresh subject, comparative anatomical studies in lower animals, and numerous experiments with rabbits, cats, and dogs, the writer comes to the following conclusions regarding the functions of the omentum:

(1) It has no spontaneous motility.

(2) No demonstrable chemotaxis.

(3) No intelligent and spontaneous protective rôle (as sometimes alleged).

(4) It can not restore vitality to necrotic organs, nor vascular supply to those deprived of their circulation (save partially in the case of the spleen, to which it is already normally attached).

(5) It does not invariably spontaneously repair defects in hollow or solid viscera, though it sometimes does this (imperfectly) in man, as in some cases of perforative appendicitis.

(6) The usefulness of the omentum in inflammatory lesions depends upon its power to form delimiting and isolating adhesions, and its power of absorbing toxic products or destroying them by virtue of its phagocytic elements.

(7) The chief functions of the omentum are those of any other mesentery, namely, the fixation of the viscera and vascular supply.

(8) When the omentum is adherent to a tumor, the probability is that the mass is inflammatory and not neoplastic; if a neoplasm, it has undergone inflammatory change.

(9) An "adhesion" of the omentum to the gall bladder is not necessarily the result of inflammation, but is to be regarded in some cases as representing a normal mesentery for that viscus.

(10) In abdominal incisions the peritoneum should be carefully closed with continuous catgut suture to avoid omental adhesion.

(11) The omentum will absorb large quantities of fluid and small particles in suspension.

(12) Too much should not be expected from grafts of the omentum. A detached piece of omentum rapidly becomes necrotic and is useless. Only intact portions of the omentum produce serviceable adhesions.—SURG. J. F. LEYS.

BUCHANAN, J. J. **Treatment of Peritonitis Consecutive to Appendicitis.** Med. Record, Jan. 28, 1911.

The author states that since 1907 he has treated most of his cases of peritonitis due to appendicitis by removal of the appendix, release of pocketed pus, dry mopping of pus within easy reach, and closure of the abdomen without drainage. Liberal post-operative treatment is allowed as regards position in bed, etc.

Twenty-two cases have been treated in this manner and all but two recovered.

"The peritonitis in these 22 cases had been advancing from a few hours to seven days and it should be remarked that all the patients whose peritonitis was three days old or less recovered, and of the two who died the peritonitis had existed, respectively, six and seven days."

The following conclusions are stated and the author believes they will be generally agreed to:

1. Peritonitis is a condition which presents an infinite variety as to its extent, ranging from a slight area to a general involvement of the entire serous surface.
2. The tendency to spread and involve new surfaces depends on the size of the causative perforation, its location, the character of organisms, the resisting power of the protective body cells, and, above all other things, the treatment with regard to purgation.
3. There is a varying natural resistance to the process by the formation of protective and localizing adhesions and the absorption of exudates already formed.
4. Early formed protective adhesions are likely to wall off an area about the original infective focus with the formation of a single localized abscess with extremely favorable prognosis.
5. Late formed adhesions after widespread involvement are likely to result in multiple pus pockets scattered through the peritoneal cavity, attended with general septic infection and unfavorable prognosis.
6. The tendency toward favorable localization, general diffusion, or widespread pocketing can not be foretold in any considerable proportion of cases at an early period of the disease.
7. While the rate of advance varies in different cases the general rule is that the longer a progressive peritonitis has continued the more difficult is its management and the more unfavorable its prognosis.

None of these conclusions tells why the cases recovered after the abdomen was closed.

In his cases the character of the infecting agents is not stated. In appendicitis the active cause may be one or more of several organisms. It seems that consideration of the cause should lead to discrimination in selecting the method of treatment of the abdominal wounds.

The question is further complicated by the fact that the infecting bacteria vary in potency for damage and the same is true of each individual species. For example *B. pyocyaneus* runs all the way from a mild saprophytic growth to one of explosive virulency. One streptococcic infection will produce dense limiting adhesions while another will not be limited at all. Some strains will elaborate more toxins than others.

Only in a general way can it be foreseen what the outcome will be. The infection may be a mixed one. In these cases, however, it must be said that the colon bacillus usually overcomes the others and in many cases destroys itself by overgrowth and the production of antibodies, so that in a large number of abscess cases the pus may appear to be most virulent while in truth it is sterile. This fact may be the real reason for the remarkable results of the author's cases as well as for the good outcome of what he terms "Ochsner's Fabian policy" in the treatment of appendicitis.

The day has not come when we can prophesy which individual case will progress favorably, and until that day does come most surgeons will have a more tranquil mind if they have left at least a cigarette drain in pus cases.—(E. T.)

PETERSON, P. **Treatment of Ascites by Drainage Into the Subcutaneous Tissue of the Abdomen.** The Lancet, Oct. 29, 1910.

Drainage of the peritoneal cavity by strands of silk had been tried by the author and found wanting because the intraperitoneal portion would become encapsulated and capillary action cease.

Drainage through glass buttons has been substituted with success. The buttons consist of perforated glass cylinders with large flanges at each end. The holes are one-twelfth inch in diameter and the cylinders vary in length to fit any abdominal wall.

The operation is simple and is as follows:

An incision, about 3 inches long, is made in the middle line below the umbilicus, and the peritoneal cavity is opened in the line of the incision. If the abdomen has not been previously tapped the greater part of the ascitic fluid escapes at this stage. The omentum is now drawn down and removed at a level well above the point where the drain is to be placed, because, if left, it very soon passes into the opening in the drain and completely blocks it. The subcutaneous tissues are now dissected outward, on one side, till the semilunar line is exposed, and through this an opening is made into the peritoneal cavity. This opening should just be large enough to permit the button being placed in position. The drain may be passed either from the peritoneal or subcutaneous side, but if from the latter care must be taken to avoid stripping the peritoneum from the edge of the opening when inserting the tube, or the flange may come to lie between the peritoneum and the subperitoneal tissues. By slipping one flange edgeways through the opening there is no difficulty in placing the button in position. When a suitable size has been chosen one flange should lie flat on the peritoneum and one on the abdominal aponeurosis, without any pressure being exercised on the intervening tissues. If too long, the apparatus would project into the peritoneal cavity, and the intestines might get nipped between the flange and the abdominal wall; while if too short, the button would tend to cut its way through the thickness of the tissues in its grasp. If the opening for the drain has been made too large and the edges do not grip the button firmly, a purse-string suture should be placed close to the button on the aponeurotic side, so that when tightened the soft tissues are brought into close contact with the groove in the drain.

The subcutaneous tissues are next closely stitched by a continuous suture to the anterior layer of the sheath of the rectus. This suture is placed about 1 inch from the margin of the primary incision and parallel with it. By this means the superficial end

of the drain is shut off in a compartment of its own, and the fluid, as it escapes from the peritoneal cavity, is prevented from throwing too much strain on the suture closing the skin incision. The primary wound is sutured in the usual manner, the skin being closely stitched by a buttonhole suture to prevent any leakage. A collodion dressing applied to the wound gives additional support. This dressing is reapplied as often as required till the skin wound is firmly healed.

More or less œdema occurs until absorption becomes established. The author has used the button in cases of ascites due to malignant disease and cirrhosis with great relief of abdominal tension.—(E. T.)

TILTON, B. T. **Special Dangers Associated with Operations on the Biliary Passages and Their Avoidance.** Medical Record, Sept. 3, 1910.

There are special difficulties and dangers connected with surgery of the gall bladder.

The diagnosis is attended with such uncertainties that the operator must always be prepared to cope with unexpected and serious conditions.

Shock and sepsis can not always be avoided, but much can be done toward prevention of these complications by the exercise of care and judgment.

For example, the subjection of a septic, jaundiced, exhausted patient to a choledochotomy will often be fatal, whereas a temporary cholecystostomy for drainage, followed a few weeks later by removal of the obstructing stone from the common duct, will usually save his life and end in a complete cure. The removal of a septic gall bladder which has ruptured and is surrounded by pus, means a very hazardous undertaking, whereas cholecystostomy by fulfilling the vital indication, viz, drainage, is the safer operation and may be supplemented later by a cholecystectomy, if necessary.

Judgment must be used on the other side of the question also, as a secondary operation on the biliary passages is more difficult and dangerous than a primary one on account of extensive adhesions requiring dissection, etc.

Hemorrhage—

following operations for gallstones need only be considered in its relation to cholemia. The latter condition, when marked, may mean very dangerous post-operative oozing, and many deaths occur from this cause alone. In case the obstructing stone in the common duct is movable, the jaundice may clear up from time to time, and during the interval operation is without serious danger from hemorrhage. In case of an impacted stone, however, the cholemia becomes more and more severe, the jaundice and its accompanying symptoms constant and more intense, and operation under these conditions is very hazardous.

If the obstructing calculus is to be removed by primary operation every endeavor should be made to increase the coagulability of the blood in order to limit post-operative oozing. The preliminary use of calcium salts and of gelatin injections has rendered some service. Animal serum has been employed. The author finds the best results

from the use of human blood serum. This gives the same results as direct blood transfusion in a much simpler manner.

Uremia must be borne in mind and a careful examination of the kidney function made—

Long-continued inflammation of the biliary passages in the form of chronic cholecystitis and chronic cholangitis is followed gradually by inflammation of the kidneys of a subacute or chronic type.

It is not uncommon for middle-aged patients to die in a few hours from anuria and uremia.

All operations in the upper part of the abdominal cavity are attended with risk of post-operative pneumonia. Old people, alcoholics, and fat persons are liable to this complication.

To avoid development of pneumonia the body should be kept warm, and the head of the bed should be elevated to give the diaphragm free motion. The aged patient should sit up as soon as possible to avoid hypostasis.—(E. T.)

HALD, P. T. **A Simple Method for the Relief of Certain Forms of Odynphagia.** Med. Record, Feb. 25, 1911.

In a paper read before the Medical Society of Copenhagen in December, 1910, Dr. Hald stated that among 46 cases of inflammatory diseases of the tonsils and their surroundings, in which odynphagia was marked, it was possible to relieve this symptom more or less completely by pressure (1) on the tragus, or (2) on the upper part of the mastoid close to the pinna. Tragus pressure was usually more successful, though mastoid pressure gave a better effect in a few cases.

He believes the effect is secured through pressure upon certain points in the "hyoid hyperalgetic skin area" described by Head, sensory impulses from which reach centers in the cord closely associated with the centers reached by sensory fibers from the affected parts.

Whether or not this be the true explanation of the effect secured, the writer recommends employment of the method in peritonsillar abscess, tuberculous laryngitis, and other affections in which swallowing is painful, the tragus pressure being applied and continued during the ingestion of food. Pressure may be maintained by the fingers of an attendant, but this is difficult and fatiguing. He has therefore devised a pressure apparatus to be worn by the patient during a meal. The appliance consists of a transverse bar to which are attached two vertical bars adjustable as to distance apart. At the top of each vertical bar is a thumbscrew acting on a rubber pad pressed against the tragus. The horizontal bar hangs well below the chin out of the way.—SURG. J. F. LEYS.

HYGIENE AND SANITATION.

Medical Director H. G. BEYER and Surg. C. N. FISKE, United States Navy.

MELVILLE, Lieut. Col., R. A. M. C. **Food Requirements for Sustenance and Work.** Brit. Med. Jour., No. 2600, Oct. 29, 1910.

In his opening paper on the "Discussion" of this subject before the section of physiology of the British Medical Association, Melville at the outset says that he takes "an actual concrete instance of men doing a measured amount of work on a measured amount of food, in which the effect of these two factors on the weight, general condition, and well-being of the individuals experimented upon was carefully recorded."

Twenty sound infantry soldiers, unselected so far as habits or physique were concerned, averaged in weight 64.15 kilos. The work consisted of a daily march of 12 or 13 miles, carrying a load of 24.55 kilos; six days of this work was followed by one day of rest and five more days of marching, which completed this part of the experiment. Computation of external work performed in accordance with Zuntz's formula required the daily average expenditure of 1,034 calories in energy. Internal and other external work were assumed at 3,000 calories, this calculation also conforming to Zuntz's observations.

The food supplied varied somewhat during the first and second periods of the experiment. It consisted essentially of bread, meat, potatoes, jam, and sugar, with tea, pepper and salt, etc. During the first six days tinned meat and biscuit were issued; during the remainder of the period fresh meat and bread. The ultimate constituent principles were as follows: During the first week, proteins, 190 grams; carbohydrates, 510 grams; and fats, 58 grams. During the remainder of the time, proteins, 145 grams; carbohydrates, 450 grams; and fats, 110 grams. The total energy value average on the first week 3,426 calories, and on the second 3,503 calories. The averages over the whole period were as follows: Proteins, 168 grams; carbohydrates, 480 grams; and fats, 84 grams. The average gross daily energy supplied was 3,481 calories. From this 10 per cent should be deducted for unavoidable waste, giving net, say, 3,140 calories. (It must be noted here that in the above calculation the energy value of a certain amount of alcohol has been included; 2½ ounces of whisky on one occasion and of rum on another were issued, owing to weather conditions and extra fatigue.) Comparing the amount of energy supplied by the food with that expended in work, taking the average per man per day in each case, we find that the former fell short of the latter by about 890 calories.

A general and steady rise of weight (averaging 0.55 kilos daily) was noted for the first three days and was attributed "to retention of water in the tissue" and protein storage in exercised muscle. For the two following days the weight was stationary, after which (with the exception of a slight rise following the day of rest) it fell steadily. "The average fall was 1.22 kilos for the maximum and 1 kilo over the whole period." During the first six days the average girth of calf increased 0.22 and of abdomen 0.54 of an inch (lumbar muscles). During the last five days the average daily loss of weight was 234

grams, represented probably by a loss of about 60 grams of fat and 170 grams of flesh. Chest measurements fell 0.56 inch for first week and 0.42 inch for second week, due to wastage of pectoral muscles. Abdominal girth fell over 1 inch and calf girth 0.16 of an inch during second week.

Melville believes the food allowance of first six days ample and, if anything, perhaps too generous, the 145 grams of protein of the second week he unhesitatingly states to be as low as it is advisable to go and might be increased for hard work, exposure, and the vicissitudes of service. The nature of proteid food is considered of more importance, so far as any possible danger of 150 grams is concerned, and here cheese and leguminous plants may be of assistance. Craving for more bread and sugar was noted. Fats were too low during the first week, as evinced by "sinking of the cheeks and hollowing of the eyes;" they were eaten with avidity when abundant during second week; "a ration of 150 grams of fat would not be found too much if hard work is to be done, and here again cheese is a valuable adjunct." Opinion was sought as to the most suitable form of food when great energy is required and portability has to be considered. In the discussion this question was answered by carbohydrates, especially sugar (as jam), not only as ready sources of energy, but as doubtless intimately participant "in the metabolism of protein tissue." Views varied materially between those of Hutchison and Haldane favoring the Atwater protein standard and those of Cathcart, Haig, and others who seemed to either favor a protein content somewhere between the dietaries of Atwater and Chittenden or to consider the latter's conclusions not disproven. Melville, in closing, interpreted McCay's observations on Bengalis as confirming his own views.—(C. N. F.)

BEEBE W. L. **Carbo Gasoline Method for the Disinfection of Books.** Jour. Am. Pub. Health Assn., Vol. 1, No. 1, Jan., 1911.

Two per cent carbolic acid in "88 Baumé gasoline," which is very volatile, effectively disinfected in 20 minutes books whose pages had been smeared with *B. diphtheriæ*, *B. typhosus*, *B. coli communis*, *S. pyogenes aureus*, and tuberculous sputum. Bindings sustain no damage even after two or three hours' immersion unless oil-paint lettering has been used, and not even then if care be exercised not to rub the letters until the gasoline evaporates. Gasoline of lower specific gravity answers well but requires longer drying. To disguise the odor, possibly offensive to some, the writer added essential oils to deodorize: Oil of pepermint, 3; wintergreen, 1, and cinnamon, 1 part. Gasoline, and the book until dry, should be kept away from fire.—(C. N. F.)

BUCHAN, G. F., M. D., D. P. H. **Typhoid Fever and Mussel Pollution.** Jour. of Hyg., Vol. X, No. 4, Dec., 1910.

Based upon data accumulated from personal investigation of each case of typhoid fever in Birmingham, England, for the five-year period ending June 1, 1909, Buchan classified the probable etiology of the 855 cases as follows:

Personal contact	33
Mussels (conclusive evidence in 17 cases)	124
Other shellfish	32
Watercress	5
Unknown	661

Upon charts plotted and the results of laboratory experiments these additional conclusions are founded:

(4) The curve of mussel-typhoid cases arranged in their weeks of commencement tallies closely with the importation of mussels into Birmingham.

(5) Mussel infection is one of the causes contributing to the autumnal rise of enteric fever.

(6) Some of the sources from which mussels are sent to the Birmingham market are known to be exposed to dangerous sewage contamination.

(7) Sixty-five samples of mussels obtained on entering the Birmingham market from 22 different known sources were analyzed bacteriologically.

(8) The results in terms of (*a*) the total number of organisms, (*b*) the number of *glucose-fermenters*, (*c*) the number of spores of *Bacillus enteritidis sporogenes*, and (*d*) the number of *Streptococci* show that pollution to a dangerous degree of a large proportion of mussels placed on the market for human consumption exists.

(9) Fourteen experiments were carried out in relation to mussels subjected to moist heat at 100° C.

(10) These show that the ordinary method of cooking mussels does not remove the risk of typhoid infection and that mussels may be heated in a steam sterilizer at 100° C. continuously for as long as four and a half hours without sterilization.

(11) Legislation is necessary to prohibit the gathering of mussels for human consumption from mussel beds exposed to sewage contamination.—(C. N. F.)

MCCONNELL, G., M. D. **The Duty of the Community Toward Its Consumptives.** Interstate Med. Jour., Vol. XVII, No. 12, Dec., 1910.

The author reviews the economics of tuberculosis as a preventable and eradicable disease, showing that at the lowest estimate consumption involves a direct loss of $10,000,000 to Maryland each year, $37,000,000 to Illinois, $7,000,000 to Ohio, $23,000,000 to New York City and, with 150,000 deaths, a loss of $350,000,000 throughout the United States. The two earliest steps toward control were Koch's discovery of the cause and the discarding of the idea of hereditary infection.

The next measures for the community to take are compulsory notification and registration to begin the campaign; the danger to others being in direct proportion to the ignorance and carelessness of the patient, his education is of primary concern. The visitor who

sees the case promptly decides whether or not the patient and family are to be trusted to carry out the instructions of the attending physician; if not, force is justified.

Besides furnishing verbal and printed information the visitor should obtain systematic data relative to case history, occupation, social existence, sanitary environment, size, illumination, ventilation, relative cleanliness, and number of occupants of rooms, and for each case determine if the interests of the patient and others require removal to a hospital. A laboratory for free examination of sputum, with ready facility for distributing and promptly collecting bottles in each police district, is essential. However, "a good physician should be able to make a diagnosis of tuberculosis by means of a physical examination before the tubercle bacilli appear in the sputum." A negative laboratory report by no means excludes the disease, and the earlier the diagnosis the better for the patient and his associates. Much can be accomplished by appeal to the laity as well as to the medical profession by circulars translated into all languages necessary, traveling exhibits, public addresses, and illustrated lectures to schools, societies, and particularly to employees and trade unions. Apartments and clothing should be disinfected at municipal expense. The patient should be seen frequently and case followed closely; suitable food, milk, and eggs should be furnished the destitute.

Suitable hospitals are necessities for destitute cases, for those who can not or will not exercise proper precautions, and for the majority of the dying. Free dispensaries with physicians, nurses, and proper facilities for thorough physical examinations, prescribing, and keeping of records, are desirable.

"On the day following the first appearance at the dispensary the patient should be visited in his home by one of the dispensary nurses, who makes a special report concerning the social conditions. Disposition is made of the case as can best be done. If the patient is in an early stage, the sanitorium or day camp is to be recommended; if he is far advanced he is sent to the hospital. If either of the above can not be carried out the home treatment is instituted. The patient must report at stated intervals in orde rto record the progress of the condition. He is also repeatedly visited at his home. Medicine and food may have to be supplied by the city in many instances."

The sanatorium day camp will care for many ambulatory cases from 8.30 a. m. to 4.30 p. m., furnishing three meals, keeping physical records, and prescribing proper rest and exercise; for the homeless, an adjoining cottage hospital with inexpensive sleeping accommodations will be required.

Such institutions as prisons, almshouses, insane and other asylums are in some localities still hotbeds of the disease. Antispitting ordinances are essential, since "the great majority of cases of tuberculosis are acquired by the inhalation of infected sputum is a fact that can not be too widely known nor too much insisted on."

Biggs, of New York, is quoted as stating that in that city there has been a more rapid fall in the tuberculosis death rate than in any other great city in the world, notwithstanding the more unfavorable conditions such as districts containing 800 people to the acre.

"During the past 10 years there has been a decrease of 40 per cent in the death rate from pulmonary tuberculosis and tuberculous meningitis. * * * There has also been a decrease in the total tuberculous death rate between 1887 and 1902, a period of 16 years, of 40 per cent."

These results, the author concludes, declare "the greatest privilege of the physician to be to lend his aid in the advancement of such a campaign."—(C. N. F.)

BALFOUR, A., M. D., B. Sc., F. R. C. P. E., D. P. H. **Some Aspects of Tropical Sanitation.** Sanitary Jour., Sept., 1910.

Speaking from his experience in Khartum, Balfour upholds the sanitary inspector as the backbone of sanitation in tropical dependencies. "Certain failures in antimalarial measures have been due to his absence." He should be taken from well-trained men at home and act as intermediary between the principal health officer and the native subordinates. In order to obtain inspectors who have passed rigid examinations, the pay should be good, posts attractive, they should be pensionable; both leave and study-leave periods are requisite for enabling them to keep abreast of the "exceedingly changeable" advancement of sanitary science. As the service is mounted, inspectors should be able to ride.

In the Tropics the inspector's chief ally is the sun as a dessicator, disinfector, deodorizer of dejecta, reducer of pathogenic bacteria in superficial waters and perhaps a tardy eliminator of breeding places for flies; the sun is not an enemy wholly in producing nervous exhaustion, sunstroke, and sun headache, for it speedily weeds out the unfit inspectors and sanitary workers. Natives are amenable to sanitary discipline providing tact and respect for their few religious and racial prejudices are exercised. However, the militant hygiene of Panama has no place in the Sudan; although cultured fanatics, such as antivaccinationists, are absent, apathy and habits of bribery abound among the low-class Egyptians, Greeks, and Italians. The medical officer of health must train and aid his inspectors, look well after their interests, back them to the uttermost when right, not press them too hard, and be prompt to reward faithful service.

Insect life is the inspector's chief enemy, hence thoroughly practical courses in mosquito and other insect control at the research laboratories are essential. The native subinspector requires incessant supervision to see that such breeding places as channels in standing crops are petrolized, yet from his training this same native may be able to find mosquitoes breeding in tubs for soda-water bottles,

or in tins under refrigerator legs in the laboratory itself. Steamers may at times import mosquitoes which will promptly breed in places from which their predecessors have been eliminated.

Smallpox is apt to be overlooked during epidemics of chicken-pox "in unvaccinated communities, smallpox reverts to its old type and becomes a disease of infants and of children, one sure proof of the preventive action of vaccination." In the presence of cerebro-spinal fever "formament lozenges [are] useful." Measles is rare but troublesome, not dangerous owing to absence of pulmonary complications. Diphtheria is difficult to control, due to the habit common to Syrians, Arabs, and others of "flocking to see a sick child." Typhoid and dysentery are restrained by conservancy methods of sewage disposal; the bucket system prevails in towns owing to lack of water for the better water-carriage system; buckets are removed in camel-drawn carts each night, emptied from mule-drawn trollies, well cleaned, and returned. Septic-tank disposal promises fair results, because Mohammedans employ lavage and supply some water; but great hopes are placed in sewage farms for growing fodder, but not vegetables for human consumption. Outside the smaller villages the small incinerator is more practicable. The birth rate is high, and modern protective measures hold out a future for coming generations.

Milk for children from the government dairy farm is expensive, and the filthy habits of native women vendors have been overcome by registration, inspection, and collection into municipal tins at the central station when the well-covered cans are returned to the vendors clean for the next day's supply.

The inspector's work is never done; he must "supervise the railway gang who keep the tramway in order; he is responsible for refuse destruction; he controls the mineral-water factories; he keeps an eye on the markets; especially our primitive fish market, and the slaughterhouses. House to house inspection * * * never-ending mosquito work * * * few noxious trades and innumerable other details require attention." Tropical sanitation means ceaseless and exhausting but successful war.—(C. N. F.)

BEVERIDGE, W. W. O., D. S. O., Maj. R. A. M. C. **Table Jellies.** Jour. R. A. M. C., Vol. XVI, No. 1, Jan., 1911.

This valuable contribution to the chemistry and physiology of gelatin requires reference to the full text by those especially concerned with the subject of nutrition. The use of jellies in the military service appears to be limited to the sick, large quantities having been furnished typhoid patients in the South African War; they seem to have been prescribed for the savory relief from monotonous diet rather

than for their undoubted nutritive value. Merlin is quoted as stating that in addition to sparing protein, gelatin may be assimilated inversely as the protein condition of the body for "protecting its living substance." Those in failing nitrogen equilibrium assimilate gelatin the more readily; it is easily digested and, having the power to fix excess of acidity, it is valuable in certain digestive disorders. Calf's-foot jelly is probably superior to the collagen derived from bones and hides only in the very small amount of native albumin which Millon's reagent would indicate in the former. Gelatin, considering its fuel value of 1,570 calories per pound is an expensive food, yet as a source of heat and energy it has its proper uses even though it can not be converted into protein tissue without the addition of 4 per cent tyrosin, 1 per cent tryptophane and 2 per cent cystine as found by Kauffman. As a matter of fact, granulated powders for table jellies owe their food value chiefly to sugar (50 to 80 per cent) while the gelatin amounts to but 13 to 17 per cent; citric or tartaric acid constitutes 1.5 to 2.5 per cent. Pure gelatin possesses a cloudiness which by no means diminishes its fuel value. Bottled jellies, aside from inconvenient bulk, possess the further disadvantage of not keeping well without the addition of objectionable preservatives (sulphurous, salicylic, or benzoic acids or salts). Molds generate gas, raise the acidity to the point (0.71 per cent as acetic acid) where liquefaction above 0° C. is permanent and ingestion of the product is followed by intestinal fermentation and diarrhea. Jelly squares or tablets packed in oil paper and cardboard boxes also tend to spoil. Granulated jelly powder is the preferable form for active and tropical service.—(C. N. F.)

McLaughlin, A. J., U. S. P. H. and M. H. S. **The Significance of the Bacillus Carrier in the Spread of Asiatic Cholera.** N. Y. Med. Jour., Jan. 21, 1911.

Carriers are very numerous during cholera epidemics and are probably the sole means of transporting the disease over considerable distances. The organism is not found in the urine and usually disappears from the stools within 10 days although not invariably, since Pfeiffer cites cases from nine other authors in which the vibrio was found from 12 to 49 days and his own case for 69 days. Chronic carriers analogous to those of typhoid are unknown. Such bearers of the contagium may pass quarantine, if their stools are not examined, and become sources of danger either through depositing excreta where there is no proper sewage disposal or through carelessness in neglecting to cleanse hands after defecation; contamination of low-growing plants by night soil and of food by flies would be likely in many rural and Oriental regions.

When every other means had been exhausted to prevent introduction of cholera into Bilibid prison and later to eradicate the disease,

the stools of 264 healthy persons (who handled food and water) out of 3,000 prisoners were found to contain cholera vibrios in 17 instances (6.44 per cent). The disease disappeared promptly following the enforced thorough disinfection of hands under guard when the prisoners left the latrines and before eating. The additional routine measures comprised screening of latrines, sterilization of water, prohibition of uncooked food (vegetables, fruit, or milk), five days' quarantine and stool examination of all incoming prisoners.—(C. N. F.)

SANDWITH, F. M., M. D., F. R. C. P. **The Value of Vaccination and Revaccination.** Lancet, Dec. 24, 1910.

The steady reduction in the percentage of children born in England and Wales, vaccinated in the year 1907 (70.9 per cent) from the 74.9 per cent average of the preceding five years is noted with apprehension; the percentage of children born and exempted under certificate of conscientious objection increased from 4.8 in 1905 to 8.4 in 1907. Such an increase in number of unprotected persons must sooner or later, as always happens, result in a serious epidemic of smallpox in which its full old-time virulence will be given opportunity to develop. The growing difficulty in having first cases recognized is partly due to the lack of familiarity of younger members of the profession with the disease, confusion with chicken pox being common. "The failure to recognize a hemorrhagic case at Bristol led to the second introduction of smallpox into a general hospital." The importance of revaccination at puberty, as required in Germany, is insisted upon; deaths from smallpox in Prussia average less than 1 per 1,000,000 while in 1872 there were 2,700 such deaths per 1,000,000.

The following two lessons are quoted as worthy of reference:

Any fair-minded person should appreciate the lesson furnished by the nursing staff in 1892-3 at Leicester, where disbelief in vaccination is rampant. Among 40 nurses 6 refused to be vaccinated; 1 of these 6 caught smallpox and died from it, while 4 others contracted the disease and recovered. The sixth disbeliever, who escaped infection, was the matron, whose relations with the smallpox patients were of a less intimate character than those of the nurses.

One of the latest pieces of evidence of the immunity furnished by revaccination has been brought to my notice by Prof. Osler. At the end of October, 1898, the Second United States Volunteers were sent to occupy a district in the north of Cuba, which was said to be devastated by smallpox. The men were carefully revaccinated, and it was found on their arrival that the epidemic had been progressing since March and that there were some 4,000 cases of smallpox, occasioning 30 deaths a day. By vaccinating 30,000 inhabitants in two months the smallpox mortality was reduced from 29.5 to 9.6 per cent, and the Americans then had the pleasure of burning the isolation hospitals that were no longer needed. Not a single case of smallpox occurred in the Volunteers, though the men were constantly exposed to a most malignant type of the disease, and served for six months in the district. Previously to the arrival of this regiment only 5.6 per cent of the Cubans had been vaccinated, but it is worth mentioning that none of these died and their cases were all discrete.

The proof of correctness of Jenner's guess that vaccinia was smallpox modified by passing through the cow has been recently obtained as follows:

In Dr. S. Monckton Copeman's experiments human smallpox material was first tested on calves, but always with negative results. But inoculation of this material on monkeys invariably proved successful, and when, after one or more passages through monkeys, calves were again inoculated, an effect was produced which, after one or two more removes in that animal, could not be distinguished from typical vaccinia. From the vesicles of these calves children were vaccinated, and every one of these vaccinations passed through its course normally. The importance of these experiments consists in the fact that they gave us scientific confirmation, to an extent previously unattained, of the definite relationship of cowpox to smallpox. The mystery has yielded to investigation, and we may now agree that vaccinia is smallpox which has lost its virulence and its infectious character.

With the use of Government lymph by Army and all other public vaccinators during the year ending March, 1909, from 446,492 out of 499,820 tubes of glycerinated virus dispatched, reports showed a case success percentage of 99.3 and an insertion success of 95.9 per cent. "The public vaccinators insert lymph into at least four places" and cover the site "with a pad of wool with or without a sprinkling of boracic powder" and forbid any interference with the arm for a week.

There are many complaints against civilian vaccinators who give certificates of successful vaccination in cases where there is only one spot of doubtful value; that acquirement of smallpox by such unprotected individuals "obviously throws discredit on the value of vaccination."—(C. N. F.)

EDITORIAL. **Prophylaxie de la Syphilis.** Bul. Mens. Office Internat. d'Hygiene Publique. Tome II, No. 12, Dec., 1910.

The text for this review is furnished by the recent report of M. Santoliquido, director general of health of Italy: "Il Regalamento 27 Luglio 1905, No. 487, e la Profilassi della Malattie celtiche dal 1905 al 1908, Roma, Ministero dell' Interno, 1910."

Declared houses of prostitution have been under rigid police regulation and dispensaries and hospital wards for treatment of venereal disease have been supported by the State since the enactment of July 27, 1905. Prostitutes are physically examined by "fiduciarri" twice a week and these inspections are carefully controlled by frequent examinations by provincial, visiting, dispensary, and military physicians. The number of houses has diminished from 1,115 in 1898 to 882 in 1908; the mean number of inmates was 5,244 in the former and 6,196 in the latter year. The percentage of infected prostitutes found in 1898 was 17.3 per cent, 7.9 per cent being syphilitic; while in 1908, 10.3 per cent were infected and but 3.7 per cent syphilitic.

Dispensaries and hospital wards for the treatment of venereal disease are supported by the State in cities exceeding 40,000 population. At 102 of the former 47.504 men (30 per cent syphilitic) and 15,705 women (41 per cent syphilitic) were treated in 1908. There were 601,336 dispensary consultations. The expense to the State was 287,366.56 lires or 8.39 lires [approximately $1.68] per 1,000 inhabitants. In 124 hospital wards there were 15,102 patients (4.42 per 10,000 inhabitants); these averaged 24 days' treatment; 61.8 per cent were cured, 28.2 per cent were improved, 3.7 per cent unimproved, 5.6 per cent remained, and 0.4 per cent died.

The total of cases of syphilis in the Italian army in 1905 was 15 per 1,000 and but 11.8 in 1907; primary cases dropped from 6.3 to 4.4 per 1,000 in the same three years. Luetic mortality in the general population was 60 per 1,000,000 in 1905 and but 50 per 1,000,000 in 1908, about 63 per cent being in children under 5 years of age.

The editor dwells at length upon the importance of the new remedy of Ehrlich and Hata in expediting the elimination of syphilis which regulation of prostitution has been accomplishing so gradually. As in most European estimates, the problem of venereal disease seems to be essentially the problem of syphilis. In closing it is observed:

"The possibility of rendering innocuous, following a single injection, a person who can become without it a serious source of infection and cause irreparable injury, seems to 'orient' the control of prostitution in the direction of new methods, less restrictive of individual liberty and consequently with an easier and at the same time a more efficacious application."—(C. N. F.)

CHAPIN, C. V. **The Value of Terminal Disinfection.** Jour. Am. Pub. Health Assn., vol. 1, No. 1, Jan., 1911.

The expense to the municipality and absence of results expected from terminal disinfection have in recent years placed its value on debatable ground.

In the average family the chance of a child's contracting scarlet fever from another is only 1 in 3, "for the adult males it is only 1 in 50." The danger from infected things, upon which pathogens are rapidly dying, "is manifestly far less than from infected persons" in whom the germs "are developing in enormous numbers."

Observations in Providence, R. I., indicate that contagion occurs in only 6 or 7 per cent of exposed families, while "the theory of infection by fomites never had any but the flimsiest basis in observation and experiment." The danger lies chiefly in the patient before a diagnosis is made and, secondarily, in the convalescent and healthy carrier. Isolation until two successive negative cultures are obtained from nose and throat of a diphtheria convalescent is of great importance; disinfection of apartment and materials is of practically no moment.

Terminal disinfection was abandoned in Providence in 1905, since which time the recurrence rates for diphtheria and scarlet fever have been no higher than during the former era of disinfection and compare favorably with the rates determined in Boston, Worcester, and Baltimore, where results of disinfection are carefully recorded.

While "fomites have no appreciable part in the spread of contagious diseases, there can be little doubt that much of what is properly called contact infection is mediate, and is due to the transfer of fresh infective material on inanimate objects." Scrupulous cleanliness on the part of attendants and about the patient is the real preventive of further spread of contagious disease.

Each $1,000 out of $6,603.78 expended for disinfection in Baltimore for 1908 and the $55,369.41 expended in New York would provide a good visiting nurse to assist in caring for the sick and to instruct in methods of cleanliness, which would far more effectively diminish contagion.

Terminal disinfection is only required for a new or rare disease, especially of unknown epidemiology, invading a population which has not experienced the infection for a considerable period.

The following resolution was adopted at the 38th Annual Meeting of the American Public Health Association, at which meeting Chapin's paper was read:

"TERMINAL DISINFECTION.

"Whereas a considerable number of municipal health officers believe terminal disinfection at the conclusion of communicable disease is of questionable value and extravagant in practice; and

"Whereas a few municipal health officers of sound judgment and highest attainment have abandoned this practice as a prophylactic measure: Therefore, be it

"*Resolved*, That the municipal health officers' section refer to the executive committee a recommendation that the American Public Health Association appoint a committee to study the end results and practice in communities where terminal disinfection is no longer practiced at the conclusion of cases of communicable disease."—(C. N. F.)

KENDALL, A. I., and EDWARDS, M. R. **A Method for Determining the Germicidal Value and Penetrating Power of Liquid Disinfectants.** Jour. Infec. Dis., vol. 8, No. 2, March, 1911.

This method, although said to be simpler, comprehends the essentials of the Rideal-Walker method and also provides the all-important means for determining the penetration of liquid disinfectants.

Agar cylinders of uniform diameter infected with *B. coli* are exposed to the germicide to be tested and to the standard 5 per cent phenol for definite periods of time; cylinders are removed from the respective solutions at the end of the several intervals and washed with sterile water. From the axis of each cylinder is pushed out by quill tubing a plug of agar 3 millimeters in diameter, which is at once incubated in

sterile broth at 37° C. for several days to determine if the germicide has penetrated sufficiently to kill the organism.

"By comparing the results obtained with a given disinfectant and those obtained under the same conditions with carbolic acid as a standard, a ratio may be established which expresses in terms of carbolic acid the combined germicidal and penetrating power of the bactericidal substance in question." The following details are given:

1. Prepare a 24-hour culture of *B. coli* in plain broth of standard composition and reaction.
2. Add 10 cubic centimeters of this standard culture to 1 liter of agar (1.5 per cent agar), and mix thoroughly.
3. Pour the infected agar into sterile tubes of convenient length (1 meter) and of exactly 1.5 centimeters diameter, and allow to harden, after closing the ends with sterile rubber stoppers.
4. Allow to harden at 20° C.
5. Prepare dilutions of the desired disinfectants and a standard 5 per cent carbolic acid solution. The latter is the standard to which the other disinfectants are referred.
6. Place the disinfectants so prepared in sterile beakers, allowing 50 cubic centimeters for each agar cylinder (described below).
7. Remove stoppers from the infected agar tubes, and permit the contents to run out slowly as a long cylinder; with a sterile knife cut off portions by transverse cuts of 2 centimeters in length, and allow these smaller cylinders to fall directly into the disinfectant solutions, one cylinder for each time interval selected.
8. Note the temperature of the solutions. They should be kept at exactly 20° C. during the experiment.
9. Note the time at which the cylinders were dropped into the disinfectant solutions.
10. At the end of stated intervals (usually at hourly intervals for preliminary tests) remove one cylinder from each solution with one of the sterile holders mentioned above, wash it thoroughly with sterile water, and remove a core from the center with a sterile piece of quill tubing (3-millimeter bore).
11. Place these cores in lactose fermentation tubes, after they are properly labeled, and incubate at 37° C. for several days, making daily observations.
12. Compare the killing times of the various solutions tested with that obtained for carbolic acid, and determine the carbolic coefficient of germicidal and penetrating powers combined.

From a specimen table of usual dilutions it is observed that formaldehyde appears to be the "most efficient" germicide tested, being far more penetrating than phenol. The commercial chloride of lime (deficient in chlorine) was found to penetrate sufficiently to kill only after exposure for five hours in 10 per cent solution, while a 4 per cent formalin killed in one hour and 1 per cent in three hours; phenol, 5 per cent, required five hours, and mercuric chloride, 1 per cent, three hours.

Such emulsions as hyco, cresol, and sulphonapthol, while "without doubt efficient when acting upon naked germs, are relatively useless when their penetrability is considered."

It is obvious that various forms of organic matter, such as feces, may be incorporated with the agar prior to hardening and below the coagulation temperature of albumins for determining the penetration coefficient of any disinfectant for any particular purpose.—(C. N. F.)

TROPICAL MEDICINE.

Surg. C. S. BUTLER, United States Navy.

CASTELLANI, ALDO. **Further Researches on the Hyphomycetes of Tinea Imbricata.** Jour. of Trop. Med. and Hygiene, March 15, 1911.

The writer differentiates in tinea imbricata, a second species of hyphomycetes, for which he suggests the name *Endodermophyton indicum*. It has distinct cultural differences from *Endodermophyton concentricum* (Blanchard).

Castellani was able to produce tinea imbricata in natives by inoculating them with both strains and to grow from the resulting disease organisms corresponding to the strain used for inoculation.

The following are his conclusions:

1. That the hyphomycetes of tinea imbricata can be grown on artificial media.
2. That there is a plurality of species.
3. That in Ceylon two species can be differentiated.
4. That the disease can be experimentally produced in human beings.—PASSED ASST. SURG. M. E. HIGGINS.

YAKIMOV, M. V., and Mme. KOL-YAKIMOVA. **The Action of "606" in Sleeping Sickness.** Russk. Vratch., Oct. 9, 1910, and Sem. Medicale No. 2, 1911. Trans. from Bull. Mens. Tome III, No. 3, Mar., 1911.

The authors have experimented with "606" upon white rats which had previously been inoculated intraperitoneally with *Trypanosoma gambiense*. The parasite appeared in the blood in from two to eight days after inoculation. "606" was injected under the skin in a dose of 0.15 gram per kilo of animal.

The "606" manifests a remarkable rapidity of action, the trypanosomes disappearing in 45 to 65 minutes by fusion of protoplasm, with the nucleus, then of the centrosome and the flagellum. There has never occurred a recrudescence.

On the other hand, two rats having received simultaneously "606" and the virus remained free of infection, while untreated animals contracted the disease.

Also two rats having received "606" before the appearance of trypanosomes in the blood remained free.

From these researches the authors conclude that "606" constitutes an excellent means of treatment in the experimental infection with *Trypanosoma gambiense*, and that it will likely give the same results in the therapy of human sleeping sickness.—(C. S. B.)

IVERSEN and TUSCHINSKI. **The Action of Salvarsan in Malaria.** Deutsche Mediz. Wochenschrift, Jan. 19, 1911. Trans. from Bull. Mensuel Tome III, No. 3, Mar., 1911.

The intravenous injection of salvarsan in a dose of 50 centigrams exercises a specific action upon all the parasites of malaria.

In tertian fever, the parasites disappear most often from the circulating blood in from 12 to 48 hours after the application of the remedy. The complete disappearance of all the parasites is not, however, certain. It is good to practice also an intramuscular injection of the remedy. In quartan fever we can not destroy completely the parasites even by injecting 80 centigrams intravenously.

In tropical fever, injection of from 24 to 48 centigrams accomplishes a temporary disappearance of the round parasites, but the crescents persist showing a temporary modification in form and in the manner of staining. In some cases after a temporary diminution of the parasites and crescents, there occurs an invasion of the circulating blood by the plasmodia much more accentuated than was apparent before administration of the drug.—(C. S. B.)

NICOLLE and CONOR. **The Application of "606" to the Treatment of Kala-Azar.** Bull. de la Soc. de Pathologie Exotique, Dec. 14, 1910. Trans. from Bull. Mensuel Tome III, No. 3, Mar., 1911.

The authors report experiments upon a dog attacked with experimental kala-azar. The infection, which was very intense, was not appreciable after the fourth day following an inoculation with "606," and cure was complete on the day the animal was killed for autopsy (35 days after the inoculation).—(C. S. B.)

WHITMORE, EUGENE R., and CLEGG, MOSES T. **The Specific Treatment of Leprosy.** Philippine Jour. of Science, Vol. V, No. 6, Dec., 1910.

The authors prepared a vaccine, a glycerin extract and a soap solution from an acid-fast bacillus cultivated by Clegg from leprous tissue. These preparations were used for twelve and one-half months on cases of leprosy, without any apparent improvement in the condition of the patients.

A soap solution of leprous spleen rich in leprosy bacilli was used for two and one-half months on leprous patients without improvement in their condition.

Other cases of leprosy were treated for eight months with injections of atoxyl and also with a mixture of sodium cinnamate and mercury cinnamate, and no improvement was noted.

After treatment with nastin β extending over 17 months, leprosy cases showed no improvement.—PASSED ASST. SURG. M. E. HIGGINS.

BALFOUR, ANDREW, M. D. **The Rôle of the Infective Granule in Certain Protozoal Infections as Illustrated by the Spirochætosis of Sudanese Fowls.** Preliminary Note. The Jour. of Trop. Med. and Hygiene, No. 8, Vol. XIV.

By newer methods of investigation, especially by dark-field illumination, and the use of the Levaditi-Yamamoto method of stain-

ing tissue sections, and a modification of it for blood films, the interesting study of this fowl disease has thrown light upon other spirochætal infections.

Intracorpuscular forms of the spirochæte had been found, and it was thought that these represented its stage of schizogony in the fowl. It was not indicated how this red-cell invasion occurs, though there was good reason for thinking that the parasites themselves enter the red cells and coil or break up. The methods of investigation referred to, together with the examination of smears from liver-puncture in chicks at the time of crisis or after a dose of "606" (artificial crisis), has shown this opinion to be in error. In the liver spleen, and lung the spirochætes discharge from their periplastic sheaths spherical granules, and these enter the red cells, develop in them, and complete a cycle of schizogony. If in a well-infected chick treated with "606," a drop of liver juice be examined by the illuminator, it will be found swarming with spirochætes and with highly refractive granules. It will be soon apparent that the source of these granules is the spirochætes themselves, some of which are not moving in the usual way, but are undergoing violent contortions. The object of this is to rid themselves of the bright, spherical granules, which can be seen within them and which may or may not be the chromatin core. These are forced along the organism, finally escaping from an end and thenceforth dancing free in the medium as tiny, solid, spherical, white particles. Later the spirochæte loses it activity, becomes difficult to see, and the lifeless sheath, perhaps still containing a granule or two, drifts aimlessly or is swept aside by some still vigorous organism. Capt. Fry and others have confirmed this observation. This observer has noted the shedding of granules by trypanosomes in the peripheral blood of experimentally inoculated animals.

This author thinks he has seen the granules penetrate the red-blood cells. This chain of events explains the puzzling features which this intracorpuscular infection has presented, and brings it into line with the infective granules found in ticks, for these closely resemble those found in liver-juice films when examined by the illuminator and when stained by the Levaditi-Yamamoto process. The process used for staining the spirochætes and granules is as follows:

Smears are fixed in absolute alcohol for 10 minutes and washed thoroughly in distilled water, after which each slide is placed in an oblong glass trough containing about 10 cubic centimeters of a filtered solution of 5 per cent silver nitrate. The film side faces downward, and the slide rests on small glass rods in order to prevent contact with the bottom of the trough. The troughs are placed on a glass slab, and over them is put a suitable glass cover the edges of which, where it is in contact with the slab, being sealed by vaseline. The whole is then placed in the incubator at 37° C. for two days, at the end of which time the films are very thoroughly washed in running tap water for

about 10 minutes. They are then treated with filtered reducing solution (pyrogallic acid, 2 per cent, tannic acid, 1 per cent), under the same conditions as above, and incubated at 37° C. for an hour or so. They are then again washed very thoroughly in running water and transferred to fresh reducing solution, in which they are left in the incubator for two days. They are finally very thoroughly washed and dried.

By the use of this process the author has been able to confirm observations made with the dark field, and to show that this granule shedding occurs not only in the internal organs, but also in the peripheral blood. The same thing happens to the spirochætes ingested by ticks, and it is doubtless in this way that the granules of Leishman are formed. It is remarkable that while Leishman's granules take on Romanowsky's stain, the granules shed in the blood of fowls and chicks can not be colored by this means until they have entered the red blood cells. This fact, the author thinks, will explain why they have not been observed in other spirochætal infections. "Coccoid" forms have, however, been seen in the blood in human relapsing fever.

From these and other observations it is concluded that the fowl spirochæte is a specific entity, and the author proposes the trinomial *Spirochæta granulosa penetrans*. It is probable that other spirochætes behave in a similar manner. The granules are resistant forms, and their presence in countless numbers in the tissues might explain the mechanism of relapse and might also account for the difficulty of completely curing some of the more chronic spirochætal infections, such as syphilis and yaws.—(C. S. B.)

PATHOLOGY AND BACTERIOLOGY.

Passed Asst. Surg. M. E. Higgins, United States Navy.

MARKS, L. H. **Ehrlich's Biochemical Theory, Its Conception and Application.** Journal A. M. A., Dec. 3, 1910.

This is a résumé of a lecture delivered by Dr. Marks, by invitation, before the Anglo-American Medical Association of Berlin, on September 10, 1910. After reviewing the steps by which Ehrlich has proceeded to apply the principle of the selective chemical affinity of living cells for certain substances to the development of a *therapia magna* in micro-organismal infections, the speaker brought out the following points concerning "606" and its results to date:

Dioxydiamidoarsenobenzol, or "606," may be given subcutaneously, intramuscularly, or intravenously. It may be used either as a clear solution (in excess of acid or excess of alkali) or in a neutral suspension. The manufacture of the drug is a difficult one. It is conducted under nitrogen, being a highly reduced product, and it is kept in small glass tubes in a vacuum. In treating patients each tube must be opened and the contents either dissolved or suspended and injected immediately.

We do not yet know how much can be given to a human being as a maximal harmless dose. Presumably (from the average animal dose, including monkeys) 5 or 6 grams at one injection would be safely borne. Assuming that only half this amount could be regarded as a safe maximum, the doses now being used are all comparatively small (0.3 to 1 gram). One gram has been given intravenously with no bad effects.

Up to September, 1910, Ehrlich had distributed 20,000 doses among 500 physicians and 12,000 cases had then been treated. In all these not one case of injury to the optic nerve has been reported (as has happened with atoxyl and acetylatoxyl).

A chancrous erosion heals within 4 or 5 days, a Hunterian chancre in 8 to 20 days. Early secondaries of skin and throat heal in 2 or 3 days as if by magic. Gummas disappear, and deep ulcers become clean and granulating within a very few days. Ehrlich believes that this surprisingly prompt healing of tertiary lesions is due to the presence in the body of large quantities of antibodies which have had time to develop.

Iverson has found "606" a prompt and final cure for human spirillosis (relapsing fever), in 90 per cent of cases, in a single dose of 0.3 gram.

"606" is a powerful medicinal agent and it should be used only after the various technics have been thoroughly studied and mastered. It is for this reason that Ehrlich has withheld the preparation from the general profession until many thousand cases have been recorded by competent and careful workers. The records of these cases will act as a bulwark against any future misuse of the drug by the incompetent.—SURG. J. F. LEYS.

METCHNIKOFF, EL., and BESREDKA, A. **Researches on Experimental Typhoid Fever.** Annales de l'Institute Pasteur, Mar. 25, 1911, No. 3.

The authors, in their introduction, comment upon the fact that, although more than 30 years have elapsed since Eberth isolated the specific organism of typhoid fever from persons dead of the disease, the malady remains to-day one of the chief problems of laboratory investigations. Despite antityphoid vaccines, sera, and the recognition of the rôle of bacillus carriers, the disease continues to claim its victims, and the apparent failure of laboratories successfully to combat the affection even leads some to ask if perhaps bacteriology has not been wrong, and if, after all, the bacillus of Eberth is the true cause of the disease.

The writers experimented upon chimpanzees, monkeys, rabbits, and guinea pigs. In the chimpanzees they were able to produce the disease and recover the organism from the blood.

Conceiving the idea that there might exist some such relation between the typhoid bacillus and the disease as exists between hog cholera and the bacillus of that name, they endeavored to infect apes with the filtrate of typhoid stools, but the results were negative.

They summarize their conclusions as follows:

1. It is possible to produce typhoid fever experimentally.
2. Only the anthropoid apes show a decided susceptibility to the typhoid virus administered by the mouth.
3. The lower apes contract typhoid fever only in exceptional cases.
4. The virus of typhoid fever is produced by the bacillus of Eberth; pure cultures are capable of producing typhoid fever in the anthropoid apes.
5. There is not a filterable virus capable of an etiologic rôle in typhoid.
6. The methods of vaccination by dead bacilli, macerated or sensitized, which are capable of protecting guinea pigs against peritoneal infection are not adequate in experimental typhoid.
7. The experimental peritonitis of rodents induced by the injection of typhoid bacilli is not identical with the typhoid fever produced by the ingestion of the typhoid virus.—(M. E. H.)

MACDONALD, ANGUS G. **A Record of 90 Diphtheria Carriers.** The Lancet, Mar. 25, 1911.

The writer analyzes the bacteriological investigation of diphtheria in the borough of Crewe during a period of six months—March to September, 1910. One hundred and fifty-seven cases were notified. Of 1,178 contacts examined 90 were positive.

In considering these 90 cases the author divides them into four groups. First, those showing no clinical evidence of diphtheria, and in whom the organism is found for a short time. Second, cases in whom a history of "cold," "sore throat," etc., may be elicited. Some form of paralysis may be present. This group represents neglected cases. Third, cases without clinical history, but with some local lesion persisting—more commonly a membranous rhinitis. Fourth, cases which have passed through a definite attack of the disease, where the organism remains associated with some pathological lesion for lengthy periods after convalescence.

The more important conclusions are as follows:

1. The presence or absence of an obvious pathological condition is no criterion of the fact of a carrier, of the length of carrier life, or of virulence.
2. The length of carrier life seems to have no effect on virulence; bacilli have been demonstrated to be virulent after four and eight months in the ear and nose of different individuals.
3. Control of diphtheria depends upon the control of the carrier. A carrier should be notified as a case of diphtheria, and treated as such until the disappearance of the bacillus is satisfactorily demonstrated.—(M. E. H.)

NOGUCHI, HIDEYO. **The Serum Diagnosis of Syphilis.** A review.

If there exists any skepticism as to the value of Wassermann's reaction, this will vanish after a careful study of the author's statistical material. His work is very probably the most complete guide to the serology of syphilis extant, and embraces not only a description of the author's system in the diagnosis of syphilitic and parasyphilitic diseases, but also a description of other systems applying the "fixation of complement" to the diagnosis of these affections.

The subject matter is dealt with under 13 headings:

1. *Serum hæmolysis.*—In this section Noguchi explains briefly the action of complement through amboceptor to produce hæmolysis. The properties of complement and amboceptor are considered, and some of the terms used in immunity work are defined.

2. *Quantitative facts about hæmolysis.*—Here the author deals with the interaction of complement and amboceptor, showing that within certain limits the relationship between these two bodies is such that if the absolute amount of each necessary to produce complete hæmolysis is determined, an increase in one will permit a decrease in the amount of the other. Hence the necessity for determining the correlation values of these factors and adhering rigidly to these values.

3. *Antigens and antibodies.*—In this chapter it is shown that the Bordet-Gengou phenomenon can be used in identifying an unknown antibody. The writer has found that the fixability of the complement in different sera varies considerably, that of guinea pigs being most easily fixed.

4. *The application of the indirect method of determining antibodies to the diagnosis of syphilis.*—At first it was supposed that the antigen was specific, and would require extracts of syphilitic tissue containing the *Treponema pallidum.* It is now known, however, that the blood serum of patients suffering from syphilis will, in the presence of complement, fix this when mixed with alcoholic extracts of normal organs, or with crude tissue lecithin, and hence in the Wassermann reaction the specific antigen is not necessary.

5. *Quantitative relations of the factors in the serum diagnosis of syphilis.*—The need of utilizing a system which will permit the accurate determination of the value of all factors is apparent. It is undesirable to use a system wherein the human serum may contain an unknown amount of natural amboceptor for the alien corpuscles. This will give the same discrepancy in results as if the immune amboceptor were added in excess.

6. *Various forms of the complement fixation test as applied to the serum diagnosis of syphilis.*—About 12 different systems are taken up in this chapter, starting with the original Wassermann. The manner in which these systems are defective, as viewed by Noguchi, is here set

forth, and a good case for the advisability of adopting the Noguchi system is developed.

7. *A system of serum diagnosis of syphilis recommended by the author.*—This is described in great detail. A method of work to be followed by those who have obtained their reagents from others and who must make their own tests is first dealt with. How to collect the serum to be tested, how to prepare the corpuscle suspension, and the technique of the test are here outlined. An alternate method of carrying out the test is given, both methods giving exactly the same results. How to read the test and how to titrate the antibody content of syphilitic serum are also described in this chapter under section A.

Section B deals with "methods of preparing the reagents and of making a complete fixation test with preparations of unknown value." This is taken up under the subheads: "Complement;" "Preparation of complement slips;" "Preparation of amboceptor (including a schedule for immunization of animals);" "Method of preparing amboceptor slips;" "Preparation of antigen;" "Titration of antigen;" and "Method of preparing antigen slips." With certain precautions the author's system will permit the use of alcoholic extracts of organs as antigen, but the preferable antigen is that consisting of acetone insoluble lipoids from organs (heart or liver). Not all acetone insoluble lipoids are suitable. Some preparations have too much inherent hæmolytic property; some are anticomplementary, and some, even in the absence of these two undesirable qualities, may have little or no antigenic property. Exact procedures for determining these questions are given. In this chapter the author also takes up the quantity of antigen for fixation test, how to preserve antigen in solid form, in alcoholic solution, and in paper slips.

8. Under "Adjustability of the writer's system" are discussed some of the difficulties encountered and the manner of explaining sources of error.

9. *Inactivation of the serum in relation to the syphilis reaction.*—This chapter discusses the effect of inactivation upon the antibody. The author has determined that the process of inactivation results in a considerable diminution in the antibody, and he thus explains the need of using four times as much of the test serum when it has been necessary to inactivate.

10. *Technic of the Wassermann system.*—The author describes a number of different methods of performing the test, using the Wassermann system, including the author's method of using the straight Wassermann system (antisheep hæmolytic amboceptor).

11. *Diagnostic value of the serum reaction of syphilis.*—This gives a large amount of statistical material, which it is difficult to study

without being convinced that the Wassermann reaction has come to stay; that it may be made to render a greater service in diagnosis, but that even in its present state it serves a purpose which no other diagnostic procedure at present known can serve.

12. *The effect of treatment upon the serum reaction of syphilis.*—The effect of mercurial treatment and also of arsenobenzol injections is here considered. This is one of the most interesting chapters in the book, and contains material upon the effect of "606" upon the reaction not to be found elsewhere.

13. *The butyric acid test.*—This test is applicable to the blood serum and cerebro-spinal fluid in syphilis and parasyphilitic affections. It is also of service in differentiating infective processes of the brain, spinal cord, and meninges from other conditions which might confuse the diagnosis.—(C. S. B.)

MEDICAL ZOOLOGY.

Passed Asst. Surg. P. E. GARRISON, United States Navy.

LEIPER, R. T. **Note on the Presence of a Lateral Spine in the Eggs of Schistosoma Japonicum.** Jour. of Trop. Med. and Hyg., London, v. 14, 5, pp. 76–77.

The author reports the presence of a small, laterally placed spine on eggs of the Japanese blood fluke, *Schistosoma japonicum*. They were first noted in a specimen from Hankow, but were then detected on eggs of four other cases which were reexamined, including Cato's original material. All observers heretofore have reported *S. japonicum* eggs as spineless.—(P. E. G.)

LEIPER, R. T. **Onchocerciasis in Cattle, with Special Reference to the Structure and Bionomic Characters of the Parasite.** Jour. Trop. Med. and Hyg., London, v. 14, 6, Mar. 15, 1911, pp. 87–93.

Under this name Leiper discusses the infection of beef with the little white nodules known as "worm nodules," "worm nests," "parasitic tumors," etc., found in various parts of the world, but particularly in Australia. The parasite is a nematode worm of the family Filariidae which has been variously placed in the genera *Filaria* and *Spiroptera*, but for which Leiper, two years ago, reinstated the name *Onchocera* Diesing, 1841. The species found in Australian cattle is *O. gibsoni* (Cleland & Johnston, 1910). The author states that the specimens found in cattle in the Malay States are the same species, and he thinks those reported from cattle in the United States, India, and Java also are probably identical. The similar form reported from the horse is specifically distinct, as is probably also that of man reported from Africa.

The nodules vary in size from that of a pea to that of a walnut and are more frequently found in the brisket and forequarters, but in heavy infections may be generally distributed. They are smooth and firm, oval in shape, and lie in a stroma of connective tissue. When the nodules are carefully incised the worms squeeze out in loops and resemble catgut in appearance. The females are viviparous and contain numerous ova in various stages of development, as well as fully developed embryos. In old infections the nodules become calcified. The adult worms apparently die soon after the death of the host and the embryos do not survive cold storage any great length of time. The life-cycle of the worm and the mode of infection have not been worked out, but the agency of an intermediate host (arthropod) is almost certainly necessary. While infection of man from eating infected meat is practically excluded, Leiper considers that the use of such meat as food is undesirable, since the formation of the fibrous nodules must be the result of some acrid toxin secreted by the worms in the tissues.—(P. E. G.)

CHEMISTRY AND PHARMACY.

Asst. Surg. E. W. Brown and Pharmacist O. G. Ruge, United States Navy.

Püschel, A. **The Preparation of a Convenient and Stable Litmus Solution.** Oester. Chem. Ztg. Bd. XIII, u. Folges, p. 185–186. Aug., 1910.

The author emphasizes the importance of a process for the preparation of litmus solution, which will be stable and free from mold contamination—the chief difficulty when the usual method is employed. The technique in outline is as follows: The blocks of commercial litmus are broken up and well extracted with hot water and the combined extracts are left to thoroughly sediment out at 6 to 8° C. The clear supernatant fluid is poured off, concentrated on the water bath, filtered, and the filtrate acidified with dilute sulphuric acid. It is now again heated on the water bath for about four hours, when a flocculent precipitate forms, consisting of the color principle of the pigment. This is collected on a hardened filter and washed until the wash water is no longer acid. It is now still further washed with water until red pigment is removed and a drop of the filtrate becomes a deeply dark blue on supersaturation with caustic alkali, thus showing that the pigment desired is beginning to pass through the filter. The residue on the filter is now dissolved in warm 90 per cent alcohol and immediately filtered. This stage removes resins or other related material of contamination. The alcoholic filtrate is evaporated to dryness, the residue taken up in hot water, and exactly neutralized when the product is ready for use.—(E. W. B.)

CONTI, A. **A Method to Demonstrate and Estimate the Digestive Ferments in the Feces.** Folia Clin. Chim. e Microscop. Bd. 2, p. 308, 1910.

The author modifies a method proposed by Schlecht. After a preliminary enema a test meal of meat and potatoes is given; one hour afterwards a purgative is administered. The feces are collected, made alkaline with sodium carbonate solution, and a drop transferred to a plate containing Löffler's sugar serum. If the feces contain a tryptic ferment, the characteristic umbilications appear on the plate after 12 hours' incubation. The quantitative estimation is carried out as follows: The feces are diluted with 10 per cent glycerin tubes and the dilutions poured into gelatin tubes, which are impregnated with coal dust. After incubation the gelatin is digested, coal dust set free, and the solution takes on a dark color, the intensity of which indicates the quantity of ferment as compared with an arbitrary standard.—(E. W. B.)

MARCOVICI, E. **A Simple Method for the Estimation of Ammonia in the Urine of Diabetics for the Recognition of Acidosis.** Wiener. Klin. Woch, 1910, p. 1037.

The formalin process is recommended as the most satisfactory for the clinical measure of the degree of acidosis. The results are higher than the absolute ammonia values, as amino acids are included. The amount of the latter, however, is so small as to be practically disregarded when the output of ammonia is large. The author lays great stress on the importance of the administration of alkali in interpreting the results, since this reduces the excretion of ammonia. One part of ammonia neutralizes an amount of acid in the body equivalent to five parts of sodium carbonate. The calculation of the necessary dosage is readily made and due allowance considered as to effect on the output.—(E. W. B.)

SERVE, S. **New Process for Sterilizing Water by Potassium Permanganate.** Rev. Gen. Sci., vol. 21, p. 579, 1910.

$KMnO_4$ is added to the water to be purified and the excess removed later by means of resorcinol; for 250 milligrams of $KMnO_4$, 50 milligrams of resorcinol suffice; that is to say, 25 cubic centimeters of a 2 per cent solution of resorcinol in water. In order to purify a water of medium quality, 30 milligrams of $KMnO_4$ are added to each liter, allowed to remain two to three hours, then 4 milligrams of resorcinol added and the water filtered. For a particularly impure water 40 to 50 milligrams of $KMnO_4$ and a proportionate quantity of resorcinol are used. The author claims that this is a rapid method of purifying a contaminated or even an infected water.—(E. W. B.)

AUTENREITH, W., and TESDORPF, TH. **The Colorimetric Estimation of Dextrose in the Urine.** Münchener Med. Wochschr. Bd. 57, S 780, 1910.

Bang's method is applied colorimetrically. Ten cubic centimeters of diluted urine are boiled with 50 cubic centimeters of Bang's copper solution, rapidly cooled to room temperature and placed in a graduated flask. KSCN solution is added to the mark, this solution showed a reading of 84 on the colorimeter scale. According to the author's calculations, this reading corresponds to 43 milligrams of dextrose per cubic centimeter of urine, or 4.3 per cent dextrose. The same urine gave 4.15 per cent dextrose by Fehling's method and 4.07 per cent by Knapp's process. The new operation is considered superior to the Bang's titration method as it avoids the errors incident to the hydroxylamine solution, particularly the difficulty of determining sharply the end point of the titration.—(E. W. B.)

HESSELBACH, K. A., and LINDHARD, J. **A New Method for the Estimation of Suga in the Urine.** Biochem.-Zeitschr., 1910, Bd. 27, S 273–95.

Principle.—An alkaline safranin solution is reduced when hot by glucose (and several other sugars) with decolorization. This reaction is the basis of a quantitative determination of sugar which has several advantages over former methods. No preliminary separation of proteid is necessary. The "self-reduction" is about one-fourth of that obtained by Bang's titration of the undecolorized urine. This depends on the fact that neither uric acid nor creatinin affects the reduction of the alkaline safranin solution. The safranin method shows the same quantity of physiological sugar present as the older methods. The reagent is indefinitely stable in ordinary concentration. It must, however, at the beginning be standardized against a known sugar solution.—(E. W. B.)

EYE, EAR, NOSE, AND THROAT.

Surg. E. M. SHIPP, United States Navy.

GRIFFIN, H. Z., M. D. **The Examination of the Nose and Throat in Relation to General Diagnosis: Results in Asthma Following Nasal Operations.** Boston Med. and Surg. Jour., Feb. 16, 1911.

The author states that in a consideration of the relation between nose and throat affections and other diseases that are met by the general practitioner two facts must be kept in mind; first, that the patient's general condition affects the mucous membrane of the nose and throat and, second, that abnormal nasal conditions affect the general health. We willingly look upon diseased adenoids and tonsils as harmful, but we do not seem to be so much awake to the fact that other nasal conditions are nearly if not quite as important.

The author further states that the complaints of nasal discharge or deafness and of nasal obstruction are so often heard and so easily elicited that one would hesitate to consider them were it not for the fact that the physician generally dismisses the subject with a passing remark concerning the frequency of "catarrh." These complaints should be heeded and a careful nasal and aural examination made in order to determine just what may be expected from a nasal operation or treatment. Polypi, antrum disease, or hypertrophied turbinates may be the cause of the "catarrh." Acute headaches with fever, no matter to what part of the head the pain may be referred, are often due to sinusitis. The headache is often intense, and one may suspect the onset of a severe general infection. Many times when grippe is diagnosed, whether the influenza bacillus is concerned or not, the severe symptoms are relieved upon drainage of an antrum or frontal sinus. Indeed this is often a more urgent matter than drainage of pus from other parts of the body.

Dull, heavy headaches of a more constant and chronic type, sometimes confined to one side of the head, are quite often due to nasal obstruction or sinusitis. In these cases the turbinates may be hypertrophied or polypoid and local treatment or operation may be advisable according to the nature of the condition found.

The epileptic should have the same careful examination, including the eye, nose, and throat, that is required in cases of headache. One does not expect cure of epilepsy to follow operation, but frequently improvement has been observed.

The effect of chronic fibroid tonsils upon the recurrence of articular rheumatism and other diseases of the rheumatic cycle should be considered.

The author further states that more particularly must one emphasize the importance of a careful search for all possible causes of anemia. Anemia itself will cause intumescent turbinates and an edematous condition of the nasal mucous membranes. This must be interpreted as secondary. But on the other hand an antrum full of pus will make it difficult to improve the blood.

Patients with facial neuralgia have been operated upon several times before an antrum full of pus was discovered. The pain promptly disappearing after proper drainage. Tumors of the face and neck, including goiter, should have nose and throat examinations for diagnostic purposes. A few glands high up near the angle of the jaw, even if they are quite large, may disappear rapidly after tonsillectomy.

With tuberculous glands of the neck the tonsils are usually in bad condition, and sometimes it seems best to remove them.

In goiter, paralysis of a cord may be present even though no hoarseness exists. Cases long treated, as ulcerated tooth, prove to be abscess of the antrum.

It need hardly be mentioned that mediastinal growths and thoracic aneurism often cause paralysis of a vocal cord, generally the left, and that the patient is sometimes referred to the nose and throat department for general examination.

The author also states that irritative cough, especially night cough, may be entirely a reflex matter and sinusitis may be found. This leads directly to a consideration of certain forms of asthma, which are apparently influenced by nasal conditions.

During the year 1909, 66 cases of asthma were operated upon by Dr. Justus Matthews in the clinic of St. Mary's Hospital. In 35 cases turbinectomy was done; in 26 of these, double middle turbinectomy; in 10, one or both inferior turbinates were also resected. This was the operation of greatest frequency. In 12 cases polyps were removed. In 9, one or both antrums were drained, and in 6, deformities of the septum were corrected. Four cases were in children, and adenoids and tonsils were removed. In the general examination of these patients there did not appear to be any distinction between the types of nasal infection discoverable in the symptoms or signs of the asthma. After operation the patients were placed on small doses of iodide for two or three weeks, as is customary after nasal operations.

Reports received from 52 cases, nine months to one and a half years after operation, show that definite improvement followed in 57 per cent and a cure in about 10 per cent.

In conclusion, it may be reiterated that examination of the nose and throat for diagnostic and therapeutic purposes should not be neglected. On the other hand, these are not parts of the anatomy to be needlessly tampered with simply because they are accessible.—(E. M. S.)

THOMSON, E., M. D. **The Nonsurgical Treatment of Cataract.** The Ophthalmoscope, Apr., 1911.

The writer states that Louis Dor, of Lyon, has enrolled himself among the firm supporters of the method of treating cataract by locally applied drugs. The eminent position of the writer demands that full consideration be given to his views on this matter.

The medical treatment of cataract had fallen into disuse when Badal advised instillations and eye baths of 3 per cent solution of potassium iodide. From this time the method has had various results in the hands of different observers, although if a referendum of oculists were taken Dor thinks the response would be mainly unfavorable. Dor's own opinion is that the method, as advised by Badal, has a certain value, but that it is not sufficient for the majority of cases.

"As the result," he goes on to say, "of considerations as to the pathogenesis of cataracts I have reached a modification of Badal's technique and the results which I have observed during the last three years are such that I do not hesitate to speak of a cure in a few cases; of amelioration for the majority; of the maintenance of the status quo for others; and of failure in only a very small proportion of cases. My investigations were based on the well-established fact that cataract is produced by a ferment which passes into the aqueous humor, whereas it ought to remain in the blood. This ferment, which is a hydrating one, determines the hydration of the albumins of the lens."

With a view to the destruction of this ferment, Dor has experimented with many drugs and combinations, and has evolved the following as the best application: Desiccated sodium iodide 5 grams, crystallized calcium chloride 5 grams, distilled water 400 grams.

The results which Dor has obtained had best be given in his own words:

With this solution one can check the progress of at least 8 cataracts out of 10, can cure 1, and can expect failure in the tenth. When I speak of the "cure" of cataract I allude, naturally, to cataracts which are quite incipient—to those in which visual acuity is still one-half. At the end of two months one can get the acuity up to 1, and can restore to these patients a presbyopia which corresponds to their age, whereas in every progressing cataract the presbyopia is in advance of the age. The few striæ which are visible at the periphery of the lens do not all disappear, but no new ones are produced. The probability is that the fibers which return to normal are those which have not yet become visibly opacified. These fibers had been swollen and their refraction altered. I have aimed at the restoration of these fibers, and it is this restoration which I have called the cure of the cataract.

Partial failure may be due, Dor thinks, to the cataract being of the stationary variety, perhaps congenital.

Failures are to be expected when the cataract is associated with diabetes, intestinal intoxication, retinal detachment, or retinitis pigmentosa.

The author has treated 50 cases by means of eye baths with the above solution. Five of these have been cured for two years and have recovered normal visual acuity in each eye. About 40 returned to Dor from time to time, undergoing intermittent treatment.

They almost all say that the treatment has benefited them and that they read and work much more easily than formerly. In only five cases has it been necessary to advise cessation of treatment on account of a persistent fall in the visual acuity.

The method of using the solution consists in its application for half an hour a day for each eye, by means of a glass eye bath which has an india-rubber ring round its edge to prevent pain from the prolonged pressure of the edge of the glass, or alternately, if the pressure be insufficient, to prevent loss of the fluid over the cheek.

The solution is used warm, and it is useless to make winking movements, since what is wanted is osmosis through the cornea.

There is no smarting if the solutions are made with pure salts, freshly crystallized and protected from light and dampness. The treatment should last for several months without interruption, and can then be dropped and recommenced.

The results have been so much superior to those obtained with potassium iodide that the author is convinced he is doing a service to his brethren in making known his formula and the method of using it. He says:

One can almost promise an improvement to every patient who has still an acuity of 0.2; those who have an acuity of 0.5 and who formerly had 1 can almost always recover the latter degree.—(E. M. S.)

A PLAGUE PATIENT

RAILWAY CAR USED AS IMPROVISED PLAGUE HOSPITAL. NOTE THE ANTISEPTIC PROTECTIVE CLOTHING WORN BY THE DOCTOR.

REPORTS AND LETTERS.

PLAGUE CONDITIONS IN NORTH CHINA.

By Passed Asst. Surg. W. D. Owens, United States Navy.

[A portion of the report of the medical officer serving with the American Legation Guard, Peking, China.]

ORIGIN.

Originating in northwestern Manchuria, near the village of Khailar, on the Chinese Eastern Railway, the epidemic of pneumonic and septicæmic plague has advanced and spread until it has attained such magnitude as to menace the rest of China.

Climoa was the first to recognize the relation between Mongolian and Siberian plague epidemics and the occurrence of the disease in a species of marmot (*Arctomys bobac*). This animal is of the same subfamily (*Arctomys*) as the American woodchuck, of which there are three varieties, the *Arctomys monax*, of the Eastern States; *Arctomys flaviventris* and *Arctomys pruinosus*, of the Western and Northern States. It is allied to the American prairie dog and the ground squirrel. The latter has assumed an important rôle as a disseminator of plague in India and California.

During the winter season it is estimated that almost 50,000 trappers are engaged in hunting the Russian marmots for their skins, which they dispose of in the markets of Siberia and Manchuria. Thus, early in November Fuchiatien, the native village of Harbin, became infected by these hunters of the Northwest. For four months this Chinese village of 15,000 people has been plague stricken, and the reports of horrors and distress equal those of the great plague in London, so graphically described by Daniel De Foe and John Wilson.

The mortality in Harbin and environs is estimated at over 10,000.

From Harbin the disease has spread in all directions, infecting the Liaotung Peninsula, threatening Korea, and extending beyond the Great Wall as far south as Tientsin, Chefoo, and Peking.

VARIETIES.

The present epidemic of plague exists in its two most virulent forms, the pneumonic and the septicæmic. The type might be designated as pneumono-septicæmic. The relative presence of the two forms occurring in conjunction is indicated by Dr. Paul Haffkine's

examination of 11 consecutive pneumonic cases, in which he was able to demonstrate bacilli in the blood of 7 of the total number examined. One observer has reported the occurrence of enteric plague.

MODES OF CONVEYANCE.

Pneumonic plague is transmitted by direct contact with an individual sick of the disease. The sputum of infected patients contains multitudes of bacilli, which are ejected into the surrounding atmosphere by the usually recognized methods.

The following pertinent examples of the infectious nature of pneumonic plague are quoted:

Changchun.—On December 26 a man named Chang (a) of the (1) Fu Hseng-jen shop arrived from Harbin and died in the shop, infecting its inmates.

A nephew of this man, also named Chang (b), visited his uncle and carried back infection with him to the shop where he was employed, the (2) Fu Hseng-Chen shop. Another nephew of Chang (a), named Lien (c), visited his uncle and died after infecting another shop. Still another Chang (c) visited Lien (c) and died, infecting (5) Yung Sheng-Ch-ing shop. Yet another Chang (f) visited Chang (e) and died, infecting (6) Wan Nengch-ing shop. All the above-mentioned places were infected and deaths had occurred before the existence of plague was known. Shop (2) lost 6 men, shop (5) lost 14, and shop (6) lost 8 a total of 28 deaths.

From Harbin Dr. Haffkine reports the following varied examples:

In one house of 12, where 2 had died, the remainder had escaped; likewise the remaining 10 in a household of 16, where 6 had died. But in another house of 16 all had died. In one house there had been 5 repeated cases of infection after disinfection of the house each time. The house was finally burned.

Overcrowding, poor ventilation, lack of proper sewage disposal, the prevalence of vermin, and the inability of the Chinese to appreciate modern sanitary precautions are factors which have made possible the extension of pneumonic plague. To-day the same insanitary conditions are evident among the lower classes of the Chinese people as existed in 1345 A. D., when the plague starting in China overran the Empire, Tartary, India, and Egypt. Will history repeat itself?

No plague-infected rats or fleas have been discovered to date. With the occurrence of plague among rats it will be interesting to observe the probable appearance of bubonic plague. In this connection I believe it of importance that the Chinese in Manchuria and north China are compelled, on account of the extreme cold of winter, to keep their legs securely covered, thus obtaining considerable protection against the flea.

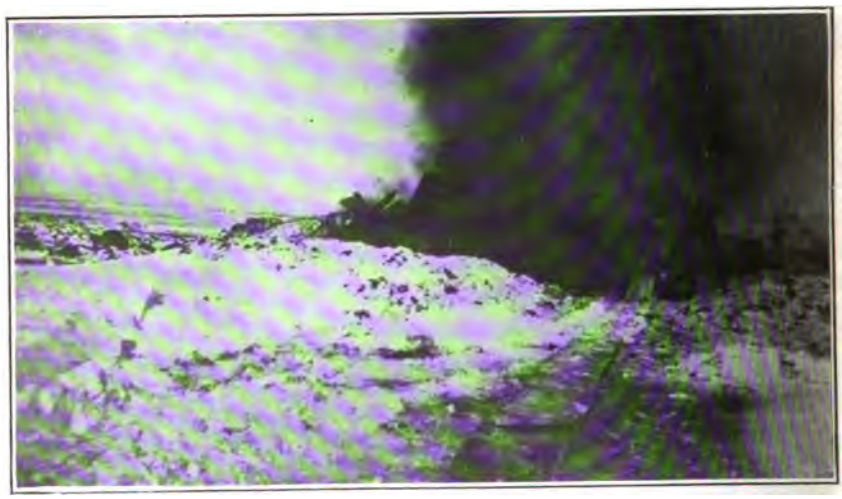
INOCULATIONS.

Considerable doubt has been entertained as to the true value of Haffkine's vaccine in producing artificial immunity against pneumonic plague. During a recent medical meeting in Peking I referred

COLLECTING BODIES OF PLAGUE VICTIMS FOR CREMATION.

COFFINS CONTAINING BODIES READY TO BE BURNED.

AT THE CREMATION PIT.



THE BURNING BODIES.

to Ehrlich's experiments in regard to the negative phase obtained in the production of artificial immunity, and the unanimous opinion expressed was that Haffkine's vaccine produced an immediate progressive immunity. It is claimed by Haffkine and confirmed by other investigators that this vaccine produces no negative period. Observers in Manchuria now believe that there is sufficient evidence to demonstrate that a negative phase following Haffkine's vaccine does exist for a period of 7 to 10 days.

Interesting data are reported by Haffkine from the partial histories obtained from 17 European deaths. The statistics include 3 doctors, 3 medical assistants, 1 student, and 10 sanitary assistants. Of these 17 cases, 9 were not inoculated, 6 had received the first injection, and 2 had received both injections.

The Russian method is to administer a first injection containing a mixture of 10 cubic centimeters of Yersin's serum and 1½ cubic centimeters of Haffkine's vaccine. Evidently the Yersin serum was intended to produce immediate immunity. They have discontinued this method in favor of a single inoculation with Haffkine's vaccine (2 to 5 cubic centimeters).

Of the two deaths occurring in those who had received two inoculations, neither had passed through the negative phase. Case No. 1 had received the second inoculation 5 days before his death. Case No. 2 had received the second inoculation 10 days before his death. Allowing 5 days for incubation and 2 or 3 days between the evidence of infection and death, the two cases undoubtedly contracted the disease during the negative phase.

In the case of Dr. Hsu, a Chinese physician, who had been inoculated 12 days before death, there was no reaction following vaccination.

The reaction caused by Haffkine's vaccine is rather severe. The first indications of a successful inoculation may be observed from the first to the seventh day. The severity of the reaction varies from a feeling of general malaise and headache to a pronounced febrile condition, the temperature ranging from 101° F. to 104° F. One should have a rise of temperature to at least 100° F. Not infrequently peculiar reactions have been observed, as otitis media, ecchymosis and œdema about the eye, and adenitis involving either the axillary or inguinal regions.

MICROORGANISM.

The absence of bubonic plague during the present epidemic led to the belief that possibly the bacillus might differ morphologically from the bacillus of Kitasato. Investigators have demonstrated that the microorganism of Manchurian pneumonic plague is the same as the bacillus of bubonic plague.

Haffkine infected guinea pigs through the nasal chamber. The pathological lesions produced in the lungs and peribronchial lymphatic glands were similar to those produced by Kitasato's bacillus. In those cases noted the bacillus gives the same characteristic bipolar staining, with carbol thionin.

SYMPTOMS.

Pneumonic plague does not exhibit a definite classical series of symptoms. The only characteristic sign which has been observed is the watery blood-stained sputum. Oftentimes the patient's condition is first noted by the appearance of delirium, death occurring in a few hours.

The disease may commence with malaise, vomiting, rigors, and fever. Not infrequently the temperature is normal or subnormal. Cough which later becomes paroxysmal is present in a majority of the cases.

Delirium develops from 12 to 48 hours after infection. It may be staggering (as noted in one of the Peking cases), while coma vigil and carphologia are not unusual. Coma intervenes, and death takes place in from 2 to 12 hours; thus the course of the disease is generally 3 or 4 days. A few cases have survived for 6 days.

TREATMENT.

Yersin's antitoxin serum has failed to lessen the severity of the disease. On account of its immediate effect it is being administered to "contacts" in doses of 900 cubic centimeters to 1,200 cubic centimeters, with doubtful results. Collargol, a preparation of silver, has been used quite extensively by the Russians. This drug is said to reduce the number of bacilli, but has not lessened the severity of the symptoms nor the course of the disease. One of the Russian physicians who died received an injection of Ehrlich's "606," with the effect that the temperature was reduced to 39.1° C. and four hours later to 38.1° C. The general symptoms became worse, and it was decided not to repeat the injection.

MORTALITY.

There is no authenticated report of a single recovery. Thus the present epidemic of pneumonic plague stands alone in medical history with the appalling death rate of 100 per cent.

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NO. 4 VOL. 5

UNITED STATES NAVAL MEDICAL BULLETIN

FOR THE

INFORMATION OF THE MEDICAL DEPARTMENT OF THE SERVICE

LIMITED TO PROFESSIONAL MATTERS AS OBSERVED BY MEDICAL OFFICERS AT STATIONS AND ON BOARD SHIPS IN EVERY PART OF THE WORLD, AND PERTAINING TO THE PHYSICAL WELFARE OF THE NAVAL PERSONNEL

OCTOBER, 1911

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TRUMAN H. NEWBERRY,
Acting Secretary.

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PREFACE.

The publication and issue of a quarterly bulletin by the Bureau of Medicine and Surgery contemplates the timely distribution of such information as is deemed of value to the medical officers and the hospital corps in the performance of their duties, and with the ultimate object that both shall continue to advance in proficiency in respect to all of their responsibilities.

It is proposed that the Naval Medical Bulletin shall embody matters relating to hygiene, tropical and preventive medicine, pathology, laboratory suggestions, chemistry and pharmacy, advanced therapeutics, surgery, medical department organization for battle, and all other matters of more or less professional interest and importance under the conditions peculiar to the service and pertaining to the physical welfare of the naval personnel.

It is believed that the corps as a whole should profit, to the good of the service, out of the experience and observations of the individual. There are many excellent special reports and notes beyond the scope of my annual report being sent in from stations and ships, and by communicating the information they contain (either in their entirety or in part, as extracts) throughout the service, not only will they be employed to some purposes as merited, but all medical officers will thus be brought into closer professional intercourse and be offered a means to keep abreast of the times.

Special attention will be given by the instructors of the Naval Medical School to the review of advances in medical science of special professional interest to the service, as published in foreign and home journals, and extracts from these will appear in the bulletin, together with such remarks as the instructors may deem of value to officers on foreign service or sea duty.

Information received from all sources will be used, and the bureau extends an invitation to medical officers to prepare and forward, with a view to publication, matter on subjects relating to the profession in any of its allied branches.

C. F. Stokes,
Surgeon General, United States Navy.

SPECIAL ARTICLES.

THE TENTH CONVENTION OF THE SECOND HAGUE CONFERENCE OF 1907 AND ITS RELATION TO THE EVACUATION OF THE WOUNDED IN NAVAL WARFARE.[1]

By Surg. FRANK L. PLEADWELL, United States Navy.

My predecessors at this [United States Naval War] College have presented very able lectures dealing with the question of what organization, consistent with fighting requirements, is best adapted to secure an appropriate treatment and disposition of the wounded resulting from a naval engagement.[2] The thoroughness with which this question has been exposed in these lectures relieves me of the necessity of discussing those subjects, except as an introduction to the main theme, and it is my purpose to dwell chiefly upon that means of relief falling subsequent to an engagement and embraced within the term "evacuation of the wounded," by an agency wholly external to the fighting unit, namely, through the intermediary of the floating hospital or hospital ship. I wish particularly to consider the rules that will govern the conduct of this vessel in the exercise of its functions on the high seas, especially those rules enjoined upon a signatory state by the provisions contained in the tenth convention of the second Hague conference of 1907. (Convention for the adaptation of the principles of the Geneva convention to maritime warfare.)

The development of a thesis in this direction grew partly out of the conviction that the fleet, in many of the situations imposed by the term of the various problems studied here this summer, especially in positions far distant from base, was hardly to be considered self-sustaining in the direction of adequate facilities for the care of the sick and the rescue of the wounded and drowning from possible engagement without the presence of the auxiliary mentioned, but mainly from the belief that there was necessity for a full exposition of the main features of the convention above mentioned.

The records of peace cruising reveal many instances of diversion of fighting ships to land sick and wounded, a procedure which might well be inadmissible under the conditions of war without gravely

[1] Lecture delivered at the Naval War College, 1910.

[2] Bogert, E. S., surgeon, U. S. Navy: Wounded in Battle on Shipboard. See Archives, Naval War College, 1908. Beyer, H. G., medical inspector, U. S. Navy: The Care and Removal of Wounded on Shipboard, etc. See Archives, Naval War College, 1909.

impairing the military value of the fleet and seriously affecting its integrity for the time being.[1]

By freeing the fighting units of their sick and promptly disembarrassing them of wounded after action the hospital ship may contribute materially to the maintenance of the fleet's integrity, to the preservation of its efficiency, and to its self-sustaining qualities when distant from the permanent base.

Preceding the removal of wounded from a vessel which has been engaged with the enemy come the various measures comprised under the term "first-aid treatment." Since the organization of a system of first-aid treatment and its adoption in our service falls somewhat short of full accomplishment, it is desirable to refer briefly to it here. Despite all that has been said and written upon this subject, neither principle nor practice seems to have reached an exact agreement as to what may be considered necessary.

The reason for this failure of agreement as to the essential features of a first-aid organization both in the direction of material and personnel appear to have resided not so much in any inadequacy of thought or treatment on the part of those concerned with it as in the difficulties which have flowed from the attempts to apply the single organization in vogue to the diverse types and classes of ships comprising our fleet, and doubtless, also, at times from considerations adduced as involving or threatening the military value of the ship.

I believe I am correct in stating that no regulations at present exist in the Regulations for the Government of the Navy compelling the organization of first aid to the wounded to be uniformly applied in all the first-class units of the fleet, and therefore the question of organization is still an open one so far as law and regulation governing this matter are concerned. It may be added that without such regulations we can not hope for uniform practice.

It may be noted, however, as ameliorating the condition indicated in the preceding statement, that the appearance of a new type of ship in the fleet, possessing not only greater uniformity of internal arrangement but also more space behind armor, has contributed to any scheme of first-aid treatment projected an advantage which, although sought for for many years, was not attainable in any of the previous types. The advantage referred to mainly affects the material side of the organization, and is that conferred by the presence in all new ships of the protected battle dressing stations. The movement which has resulted in the provision of these stations had its inception in a resolution[2] unanimously passed by the conference at this college in the session of 1908.

---

[1] See Annual Report of the Surgeon General, 1907, pp. 111-116.

[2] "The conference recommends that in new battleships two action dressing stations for wounded be provided behind heavy armor and adjacent to hatches extending through the decks above, each station to consist of an operating room for segregation of wounded during battle, one of these operating rooms to be habitually fitted as such. The remaining spaces could be used as storerooms or crew spaces during peace times." (Conference of 1908.)

It now remains for the service to achieve a completion of this organization especially in relation to the personnel required. To do this we should first be concerned with adopting some uniform method of selecting and instructing the first-aid party. It is apparent that this may be accomplished only by appropriate regulation from central authority. This is necessary in order to compel recognition and insure an invariable practice. Under the conditions now prevailing it may well happen that no two ships would reveal on inspection the same scheme of organization of its first-aid parties, particularly as to the number and character of ratings of men selected to compose them, although the ships concerned may be operating in the same division and in the same fleet.[1]

The importance of this matter is believed to be such as to merit a definite reference in our naval regulations, which it fails of having at present.

Most naval services have not only a specially-trained first-aid party, selected from among certain ratings in the crew and constituting a certain definite percentage of the war complement, but also provide for instruction of a considerable number of the ship's crew in the elementary principles of first-aid treatment.[2]

As representing a typical regulation governing this matter in another service, the following circular may be quoted:

[Ministerial circular.][3]

MARCH 1, 1906.

My attention has frequently been invited to the advantages that would accrue from the adoption of regulations governing the selection and instruction of the first-aid and stretcher-bearer personnel that may be required for each ship in order to insure in war the relief and transportation of the wounded. In this matter I have determined upon the following provisions:

Aboard each ship the number of first-aid men will be fixed by the commanding officer as a certain proportion of the war complement. It is not possible to determine this proportion absolutely, as it will vary in the different types of ships, but it will be advisable to take as a basis from 6 to 8 per cent of the crew (including officers).

The commanding officer will designate the men who will be thus assigned, abstaining as far as possible from choosing them from the civil branches, by reason of their liability to frequent transfer, or from among the cooks whose services might become indispensable during the course of a long engagement.

The men designated will be placed at the disposition of the medical officer periodically and he will be charged with their instruction. The number and duration of the periods of instruction will be fixed by the commanding officer at not less than one hour weekly, this minimum being exceeded if the exigencies of the service permit.

* * * * * * *

(Signed) ——— ———,
Minister of Marine.

[1] See "A review of the subject of organization of the Medical Department for battle," Beyer. U. S. Naval Medical Bulletin No. 4, vol. 2, p. 46.

[2] See Admiralty Circular Letter (British) on "Battle organization," May 24, 1905. (Office Naval Intelligence, No. 08/116). Also Office Naval Intelligence, No. 8937, Jan. 27, 1908, "Battle organization," German Navy. Also Beyer, U. S. Naval Medical Bulletin, October, 1908, p. 47. "Battle organization." (French and Italian.) Also Suzuki, "Experiences during Russo-Japanese war." Journal Association Military Surgeons, Nov., 1905, p. 420–446.

[3] See Archives de Médecine Navale, 1907, p. 473. See Appendix.

The organization now operative in these services calls for the distribution of the trained personnel of the first-aid party proper among the so-called relief or first-aid stations. These stations are located about the upper decks, first with reference to their accessibility from the fighting positions by the wounded, and secondly with regard to protection from shell fire. Here is located the first line of relief, where the wounded collect and receive appropriate treatment, and are then returned to their duties; or, if more seriously injured, arranged for transport below to the protected dressing station.

The use of a first-aid party in the minor protection offered by the usual relief station, and the assembly there of wounded, is believed to be not in accord with the best practice, for experience in actual warfare has tended to show that this arrangement is fraught with much peril to the wounded,[1] and to the personnel charged with their care in these situations, and that it is preferable to abandon the elaborate use of such stations during action and rely more upon making a crew self-sustaining in the direction of first-aid dressing, extending the active services of the first-aid party proper to the wounded only in intervals of fire or after the action is terminated. It is only when the engagement is over that the activities of the first-aid party as well as those of the medical party, properly begin, and exert their more important functions. Moreover, in the newer ships, it is to be noted that in action practically all the personnel, except the few individuals on the cage masts and elsewhere on upper decks, may be divided, with respect to the situations where wounded may collect and whose presence may seriously affect fighting efficiency, into three main groups, as follows:

(1) Those in turrets, conning tower, and protected station; (2) those below decks and behind armor; and (3) those below the protective deck.

It should be observed that the fighting personnel in these situations is under much better protection from shell fire than in most relief stations.

There is substantial agreement of opinion among those concerned with studying this organization that any elaborate application of medical assistance or first-aid treatment during action is largely theoretical. This opinion is fortified by the experiences of those who have had to do with the care of the wounded in naval actions of the recent past. When we read the descriptions of these actions and reflect upon the incidents that will probably be characteristic of naval combat in the future, it is not difficult to understand why

[1]See Stokes, C. F., Surgeon General, U. S., Navy; "Naval surgery," Buck's System of Surgery, 1910. Also Suzuki, "Experiences during Russo-Japanese war." Journal Association Military Surgeons, Nov., 1905, pp. 420–446. And Semenoff, V, captain, Russian Navy: "The battle of Tsushima." (May 27, 1905.) And "Organization, naval sanitary service," Pasquale. (Translated by Beyer.) See p. 477 of The Military Surgeon, Oct. 1, 1909 (a lecture delivered at the Naval War School, Spezia, Italy).

a further restriction of medical assistance during action is inevitable. Furthermore, as already noted, inasmuch as the fighting force is nowadays practically isolated in their stations by structural arrangements, and the requirements imposed by battle conditions, they are not only inaccessible to any immediate treatment by the first-aid party, but are also unable to leave their stations to reach that aid.[1] The gun crews in these places must, in consequence, be trained to largely care for themselves until a lull in or cessation of action occurs.

For reasons already adduced, the principle may also be accepted as well established that any considerable mobility of the medical personnel during action is impossible as well as inadvisable; that is, a mobility of sufficient degree to reach the wounded in the situations previously mentioned. Free movement will ordinarily be accomplished with great difficulty and surrounded with material danger, and all movements will probably be much interfered with by closure of water-tight and bulkhead doors, battle hatches, and the accumulation of the débris of battle.

The trained medical personnel, not being readily replaceable, and not replaceable at all until after battle, and only then perhaps by transfer of officers from a hospital ship, should be required to take all reasonable measures of self-preservation, so that its services may be available when most urgently needed, namely, after the engagement. Then it is expected to exercise its larger and more important duties in the care and transfer of the wounded, in the performance of which it will require the full assistance of the first-aid party. A prompt restoration of the ship to a fighting condition may represent an urgent military necessity, and the restoration may be largely dependent upon having the medical personnel, upon the completion of battle, in a condition to care for and promptly dispose of the wounded, which, of course, it can not do if its ranks are depleted by injury or its members exhausted by the excessive strain of labor conducted under adverse conditions. The policy of maintaining this personnel in a condition of safety and well-being during action is prominently enunciated by the French, but finds its most complete expression in British regulations, as may be gathered from the following quotation:

> It is very important that a suitable position should be provided medical officers of the ship. Their lives are of the greatest possible value when regarded from the standpoint of the sick and wounded. For this reason they should be stationed under the best possible protection, due regard being had to the possibility of their being incapacitated if retained during a prolonged action under atmospherical or other conditions likely to prostrate them. * * * The preservation of the lives of the medical officers is of the utmost importance for their services will be most necessary after an action.[2]

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[1] See Appendix: "Fleet regulations, Atlantic," Art. 176, par. b.

[2] "Battle organization," British Navy. See ante, p. 411.

The amount of professional labor devolving upon the medical and first-aid parties subsequent to a naval engagement, even if their efforts are confined simply to the application of necessary first-aid dressings, may be accounted considerable, and has, of course, direct relation to the duration and character of conflict and number of wounded. The views of a recent writer [1] upon what may be looked for in this direction in future warfare, largely based upon what has happened in the past, are not without material interest in this connection, and are quoted as follows:

Contrary to general expectation, there has not been an increase in the loss of life on board ships during recent battles. Gunfire has become enormously more destructive, but means of defense have been to a corresponding degree elaborated, and the range at which battles are fought has been steadily increased, so that the number of casualties necessary to compel acknowledgment of defeat, the number for which we must provide, remains remarkably constant.

In former times, every man was, on occasion, a member of a gun crew. In these days of specialization, the proportion of fighting men is necessarily smaller. Few members of the special branches can leave their own duties to replace gunners who have fallen, and we may reckon that when one-half the ship's complement is disabled, it is no longer possible to fight the ship. Therefore, we may say that when the casualties on a ship amount to one-third or one-half of the complement, she will drop out of action; and that in the event of greater loss of life, mortality in the medical department, destruction of supplies, and local conditions will make the rendering of any aid quite impossible.

Of the total number of casualties we can dismiss almost one-half from our consideration—that is, the dead and slightly wounded require no special provision. We may then expect a list of seriously wounded, who will require immediate treatment and subsequent care, comprising one-sixth to one-fourth of the complement.

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In the contest of development which is always being actively waged between the offensive and defensive powers bestowed on ships the offensive qualities have generally been in the lead. This has resulted in a tendency to depend largely on distance for defense and to let the effect of long-range gunfire decide the contest. Out of this tendency we have seen the "all big gun" ship evolved. Combat between ships of this description would be fought at long range and by guns upward of 10 inches in caliber.

The duration of battle will depend on many factors. Between ships equally matched in speed and offensive powers there is no reason to believe that the contest will be short, since the increased destructive powers of the guns is offset by the number of misses and decreased effectiveness of fire at the longer ranges. When, however, by reason of any circumstances, an overwhelming fire is concentrated on one ship, the ensuing carnage and structural damage entail a brief action.

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It must be anticipated that accidents may disable one or more officers, and when it is borne in mind that, allowing an average of 10 minutes for a dressing, 33 hours of actual work will be required to complete dressing the wounded, and that incidental demands will consume much time in the first hours after an engagement, thus delaying further the prompt rendering of assistance, it will be seen that at least three medical officers should be attached to each battleship.[2]

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[1] Surgeon General Charles F. Stokes, U. S. Navy: "Naval surgery," in Buck's System of Surgery, 1910.

[2] Stokes. See ante.

In a paper read before the conference at this college in 1909, dealing with the question of the time that will probably be required to transship that portion of the wounded requiring hospital treatment after a naval engagement in which a fleet of, say, 16 ships has participated, some interesting estimates were presented, the figures being based mainly upon the percentages of casualties occurring in the naval actions of the Russo-Japanese war. The writer assumed that the wounded would average 20 per cent of the total complement, which may be considered a reasonable figure, when we realize that the *Gromoboi* had 37 per cent of her complement wounded, the *Rossija* 20.7 per cent, and the *Mikasa* (in the Battle of the Sea of Japan) 15 per cent. Proceeding upon this basis of 20 per cent and that one-half of these will need to be transferred, the writer estimates that there will be required in four hours of time a total of 66 boats to effect the transshipment of wounded to the hospital ships.[1]

These general considerations regarding first-aid service in action have been presented as a fitting preliminary to the subject mainly intended to be treated and that indicated in the title of this paper, "The evacuation of the wounded in naval warfare," for the reason that any organization working toward the accomplishment of a prompt evacuation of the wounded from the fighting unit must be occupied primarily with first-aid measures; in other words, we can not transfer wounded out of the ship with broken bones unsplinted, bleeding unstanched, or wounds exposed. These various procedures are required to be carried out by the labors of the medical and first-aid personnel before the project of transportation is undertaken. Should the time required for these preliminaries, however, involve a conflict with the military necessities of the moment, then it will doubtless be necessary to postpone transfer, relying upon the medical party, assisted by the first aids, to proceed with the further care of the wounded until opportunity for the final evacuation is afforded.

The complete evacuation of wounded from the fleet subsequent to naval engagement on the high seas and distant from a base would appear to meet with its best, if not its only solution, in the use of accompanying hospital ships. It may be pointed out, however, that the transfer of wounded men after a battle may be difficult or impossible unless the sea is smooth and other conditions are favorable; "hence the important primary treatment of surgical injuries must, in a great proportion of cases, be carried out on board the ship of war, and the hospital ship can in no way replace the necessity for commodious sick bays, (and battle dressing stations [F. L. P.]), in the fighting vessels. The utility of the hospital ship later as a sick transport needs little comment, but it must be added that, in the absence of a complete command of the sea, naval officers may hesitate in consigning

[1] Beyer, H. G., medical inspector, U. S. Navy: Journal Association Military Surgeons, 1910 (January), pp. 22-24.

officers and men not hopelessly disabled to a hospital transport, which must run the risk of meeting ships of the enemy, with the result of interning valuable material for the remainder of the campaign." [1]

The remainder of this paper, therefore, will be concerned with discussing the question of how far these vessels may furnish adequate relief in this direction, operating with the fleet in time of war, under the conditions imposed by the incidents of a naval battle, and whose conduct, finally, is governed by the articles embraced in the tenth convention of the second Hague peace conference of 1907.

This convention deals with the adaptation to naval war of the principles of the Geneva convention of 1906, just as the first Hague conference of 1899 in a similar convention dealt with the adaptation to naval warfare of the principles of the Geneva conventions of 1864 and 1868. The Geneva convention of July 6, 1906, although the basis for the Hague revision of its convention of 1899, relating to this subject, makes no direct allusion to naval warfare.

The United States, in common with the several other naval powers, is signatory to and has duly ratified this 1907 convention, so that it now has the full force and effect of law in any conflict with a state that has signified a similar adherence, and even failing to be ratified by any state will probably govern in the event of war. It should also be observed that the original convention of 1899 still holds good between powers which were signatories to it and have not ratified or adhered to the later convention. (See article 31, Geneva Convention, 1906. See also article 25, Tenth Hague Convention.)

A brief account of the origin and development of this convention is not without interest. Up to the year 1864, when delegates to the first Geneva convention assembled to consider the amelioration of the conditions of the wounded in armies in the field, the question of assistance to wounded in naval warfare had not been made the subject of discussion between the powers, and no effort to remedy this omission from international agreement was seriously made until after the battle of Lissa in 1866. In this engagement, an exceedingly large number of men forming the crews of the Italian ships were lost by drowning, there being no adequate means of rescue at hand other than could be rendered by the combatant ships. The incidents of this engagement served to invite the attention of the various powers to the desirability of extending the principles of the Geneva convention, governing land warfare, to naval warfare. Therefore, in 1868, upon the suggestion of Italy, representatives of the powers met at Geneva and drew up several articles which sought to supply the necessary requirements. These articles, however, remained a dead letter for

[1] Makins, G. H., member of the council, British Red Cross Society, member of consultative board, Medical Department of the Navy: "Rôle of Red Cross societies during maritime war." Proceedings of Eighth International Red Cross Society, 1907, p. 236.

25 years, and the convention was not ratified by the various States, owing to difficulties inherent in the delicate question of neutralization.

While not officially ratified by the powers and hence lacking the force of law, they were observed by mutual agreement of the belligerents (excepting Turkey in Russo-Turkish war of 1877–78) in the Crimean, Franco-Prussian, Chile-Peruvian, and Spanish-American wars. In the first commission of the hospital ship *Solace*, for instance, in the United States' notification to Spain of its intention to use this ship, there was signified an adherence to the principles of the Geneva convention of 1868, notwithstanding this Government had not officially ratified the convention named. At the first Hague conference in 1899, the substance of these articles, after substantial modification, was adopted (except article 10, which was excluded) [1] and later ratified by the principal powers, and is now incorporated with further amplifications and qualifications in the tenth convention of the second Hague conference of 1907, which convention represents the last word upon this subject. This latter convention has also achieved ratification by a number of the principal naval powers, but not by all of them.

This tenth convention in the Hague conference of 1907, although the last item on the Russian program was the first to be completed, and as stated by Prof. Lawrence in his work on the Hague conferences, its provisions are "made to be observed," and, he goes on to say, "as an instrument betokening solicitude for the care of the sick and wounded at sea, if it has not outgrown war, it has at least produced workable plans for ameliorating the conditions of the most helpless and sorely stricken among the victims of war." [2]

While the sole principle animating this convention, as indicated in its preamble, is "to diminish the inevitable evils of war," or, in other words, to safeguard the interests of the naval sick, wounded, and shipwrecked, and ameliorate their condition as far as is compatible with the conditions prevailing in a state of war on the high seas, it must be realized that no diplomatic agreement between nations of diverse social traits and customs can be so perfect as to meet all the varying situations of naval combat. In the absence of specific provisions, however, to cover peculiar circumstances, not included within the scope of this convention, much, of necessity, must be left to the humane initiative and discretion of the belligerents. As was stated in the Geneva convention of 1868, "the appreciation of these circumstances is left to the humanity of all the belligerents," and in that of 1906 that "the commander in chief of belligerent armies shall arrange the details for carrying out the preceding articles, as well as for cases

[1] Now appearing as article 15 in tenth Hague convention, 1907.

[2] Lawrence, T. J. Lecture on international law, Royal Naval College: "International problems and the Hague conferences," p. 117.

not provided for * * * in conformity with the general principles of the present convention." (Geneva Convention, 1906, article 25.)

In view of the obligation imposed upon commanders in chief of the belligerent fleets, by Article XIX of this convention that they "shall arrange the details for carrying out the preceding articles, as well as for cases not provided for," and further of the requirements contained in Article XX,[1] that signatory States "shall take the necessary measures to instruct their naval forces, especially the personnel protected. in the provisions of the present convention and bring them to the notice of the public," it seems especially appropriate to expose in some detail here the nature of the provisions contained in this convention, particularly in their relation to the evacuation of the wounded from the scene of a naval action.

ARTICLE I.

Military hospital ships—that is to say, ships constructed and assigned by states specially and solely with a view to aiding the wounded, sick, and shipwrecked, the names of which have been communicated to the belligerent powers at the commencement or during the course of hostilities, and in any case before they are employed—shall be respected, and can not be captured while hostilities last.

These ships, moreover, are not on the same footing as war ships as regards their stay in a neutral port.

ARTICLE II.

Hospital ships, equipped wholly or in part at the expense of private individuals or officially recognized relief societies, shall likewise be respected and exempt from capture if the belligerent power to whom they belong has given them an official commission and has notified their names to the hostile power at the commencement of or during hostilities and in any case before they are employed.

These ships must be provided with a certificate from the competent authorities declaring that the vessels have been under their control while fitting out and on final departure.

ARTICLE III.

Hospital ships, equipped wholly or in part at the expense of private individuals or officially recognized societies of neutral countries, shall be respected and exempt from capture, *on condition that they are placed under the control of one of the belligerents, with the previous consent of their own Government and with the authorization of the belligerent himself, and that the latter* has notified their name *to his adversary* at the commencement of or during hostilities and in any case before they are employed. (Geneva Convention, 1906, article 11.)[2]

The first three articles of this convention define the objects to be achieved in the use of hospital ships in naval warfare and indicate

[1] With reference to this article, the general report states: "Article 20 is new. It corresponds to article 26 of the convention of 1906. We look upon it as being very important. The best dispositions remain a dead letter if the necessary steps are not taken in advance for instructing those who have to apply them, particularly as the personnel of hospital ships, both military and private, will often be required to fulfill a very delicate mission. This personnel must be convinced of the necessity of not profiting from the immunities accorded them to commit belligerent acts; to do so would be the ruin of the convention and of all the humanitarian work of the two peace conferences."

[2] In these articles new matter in the convention of 1907, as compared with that of 1899, is italicized.

the different classes of these vessels which are entitled to be respected. Briefly these may be described as follows:

First. Military or governmental hospital ships, i. e., public vessels of an official character fitted out by the *belligerent states;* and

Second. Nonofficial hospital ships either from *belligerent or from neutral states*, i. e. ships of a private or semiprivate character, furnished, equipped, and fitted out by private individuals or officially recognized relief (i. e., Red Cross) societies.

Under the terms of the convention all these ships are to be respected, and in the exercise of their functions are exempt from capture, provided that they comply with certain conditions. Prior to their employment those of an official character must have their names conveyed to the belligerent powers. This is done through the intermediation of a friendly state, since the notification will usually fall after the declaration of war, when diplomatic representation between the belligerents is terminated. In framing this article originally it was suggested that the notification should be made "before the opening of hostilities," but as this disposition would prevent belligerents from developing any hospital-ship service after war had once commenced it was deemed too exacting, and the words "before they are employed" were substituted.

Hospital ships of the nonofficial class, fitted out from a belligerent state, must have an official commission, and their names must likewise be notified "to the hostile power at the commencement of, or during hostilities, and in any case before they are employed." In addition they "must be provided with a document from the proper authorities stating that they have been under the control of the authorities while fitting out and on final departure."

When we come to consider the requirements imposed upon the class of hospital ships comprising those from neutral states we find a slightly different treatment accorded them. Their names must also be notified to the adversary under the conditions already stated for the official and nonofficial ships of a belligerent power, but in addition it is provided (in article 3) that this class of hospital ship shall be respected and exempt from capture only "on condition that they are placed under the control of one of the belligerents, with the previous consent of their own Government, and with the authorization of the belligerent himself." This modification is based upon article 11 of the Geneva Convention,[1] applying to land warfare, in which neutral ambulances on land are required to be placed under the control of one of the belligerents. No mention is made of the necessity of having this class of hospital ships supplied with an official commission since their status is sufficiently guaranteed by the requirements above stated.

[1] Unless otherwise stated "Geneva convention" will mean the convention of 1906, which has superseded former Geneva conventions.

In these preliminary articles, as well as in article 4, it is also stipulated that hospital ships must extend aid and relief to the wounded, sick, and shipwrecked of the belligerents irrespective of their nationality, and that while they are public vessels or partaking of the nature of public vessels, they do not fall under the usual rules of international law applying to war ships as regards a stay in a neutral port. This exemption is also implied in article 14 of the Thirteenth Hague Convention [1] which states that the rules applying to a belligerent's stay in a neutral port do not apply to war ships devoted exclusively to religious, scientific, or philanthropic purposes.

It may here be mentioned that in 1904 a convention was concluded at the Hague by the chief powers whereby hospital ships were to be exempted during war from the payment in the ports of the contracting parties, from all dues and taxes imposed on vessels for the benefit of the state. The only naval power not a party to the latter convention is Great Britain, owing to the fact that dues are levied by different authorities in the United Kingdom and legislation would be necessary to give effect to a convention of this sort, which the home Government naturally can not assure. With reference to this matter Dr. Makins states: "I may add that the British Red Cross Society has corresponded with every port authority in the United Kingdom, inquiring whether hospital ships would be admitted free of port dues in the event of war. The replies received in practically every instance are to the effect that the authorities would make every concession which the law permits them to make."[2]

With respect to the material modifications found in article 3 of the convention of 1907, as compared with a similar article in the convention of 1899, it is apparent that they seek to settle more thoroughly the relations that should exist between hospital ships and belligerents. As stated by Prof. Higgins in his work on the Hague Conferences[3]—

> The difference in the circumstances under which aid is rendered by a neutral ambulance in land warfare and a neutral hospital ship calls for different treatment, as the latter enjoys a greater freedom of action than the neutral ambulance can claim in land warfare. It was considered inadvisable, for reasons of military necessity, to allow neutral hospital ships to operate apart from the special authorization of one of the belligerents, the view that such ships might desire to aid both belligerents indiscriminately being inacceptable on the ground that to allow complete independence of action to such neutral ships would leave the way open to serious abuses. * * * Such ships will henceforth form part of the sanitary service of the belligerent and be placed under his direction.

The general report states: "The text prepared by the German delegation was modified, because it was thought to exact too much that the neutral hospital ship should place itself at the service of the belligerent. It is sufficient that it place itself under its direction."

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[1] Convention concerning the rights and duties of neutral powers in naval war.

[2] Makins. See ante, p. 241.

[3] Higgins, A. P.: The Hague Peace Conferences, 1909, p. 383.

ARTICLE 4.

The ships mentioned in articles 1, 2, and 3 shall afford relief and assistance to the wounded, sick, and shipwrecked of the belligerents without distinction of nationality.

The Governments undertake not to use these ships for any military purpose.

These vessels must in no wise hamper the movements of the combatants.

During and after an engagement they will act at their own risk and peril.

The belligerents shall have the right to control and search them. They may decline their assistance, order them off, make them take a certain course, and put a commissioner on board. They can even detain them, if important circumstances require it.

As far as possible the belligerents shall enter in the log of the hospital ship the orders which they gave them.

The opening paragraph of article 4 prescribes the duties devolving upon hospital ships, which are in brief that they shall "afford relief and assistance to the wounded, sick, and shipwrecked[1] of the belligerents without distinction of nationality." It also states that belligerents shall have the right of control and search over them, even to the extent of detaining them, ordering them off, declining their assistance,[2] putting a commissioner on board them, or making them take a certain course, but they may not be captured as long as they observe the conditions imposed. A failure to observe these conditions, however, or the use of the ship for any military purposes will give a belligerent good ground for detention or seizure.

In article 8 of this convention it is likewise stipulated that hospital ships lose their inviolability if they are employed for purposes of injuring the enemy. An instance of this character occurred during the Russo-Japanese war. The Japanese seized and condemned by prize-court procedure the Russian hospital ship *Orel*, because of the commission of certain acts construed to be of a military nature. There was evidence showing that this ship had been used to carry official messages, to make purchases of military material, and once there had been placed aboard her members of the crew of a captured prize, the *Oldhamia;*[3] and finally because there was evidence that the *Orel*, in common with the *Kostroma*, a hospital ship accompanying Admiral Nebogatoff's division, had been assigned a place in advance of the Russian main body, a position which, being ordinarily assumed by a scouting vessel, fairly created a presumption against the hospital ships named of being used for military purposes, and resulted in confiscation and condemnation of one of them.

[1] "Shipwrecked." The French word used is "naufragés," the nearest translation of which is "shipwrecked," but it implies, not sailors wrecked by storm, but those who are in danger of drowning as a result of naval action.

[2] The original French text is: "Ils pourrant refuser leur concours." This is translated in the British Blue Book and by the United States State Department, as "they can refuse to help them." It is believed that the real meaning is that conveyed above in the text of this paper, which is taken from Prof. Higgins's work on the Hague Conferences.

[3] In this connection it should be noted that article 50 of the Declaration of London stipulates that all persons removed from a prize vessel which is to be destroyed must be placed in safety, and while this safety might well be considered secure if they are placed in a hospital ship, to do so would expose this vessel to capture, as in the case of the *Orel*.

The requirement placed in the final paragraph of article 4, that "belligerents shall enter in the log book the orders which they gave them" provides a means of establishing the fact of visitation and whether or not orders are complied with, but necessarily implies the privilege on the part of the belligerent of fully scrutinizing the log. It is not unlikely that this privilege, under certain conditions, may constitute a decided military advantage to the belligerent so acting. For example, if the hospital ship visited has just come from the fleet of her own side her log may contain entries revealing to the visiting belligerent the position of the fleet, or giving him even more important military information. The advisability of restricting hospital log-book entries so as to exclude anything that might be of military value to the enemy, is obvious. We know that the log book of the Russian hospital ship *Orel* was produced before the prize court at Sasebo, and appears to have been the source of condemnatory evidence.

The obligation placed in article 4 that: "Such vessels must in no wise hamper the movements of the combatants;" and further, that "during and after an engagement they will act at their own risk and peril," raises several important questions:

How far, for instance, may these vessels find a place in the main body, during war, having due regard to military requirements?

If with the fleet, what position shall be assigned them in a cruising formation?

During engagement, what shall be their position with respect to the combatants, and when may they be considered free to venture upon the scene of battle for the purposes of rescue?

There appears to be little question that the chief naval powers, in any plan of operations that involves an oversea movement or possible naval action upon the high seas, will, in future, assign a material value to the services that may be rendered by military hospital ships, and will be prepared to employ them in the care, treatment, and evacuation and transport of the sick and wounded from the fleets during war.

The history of naval and military warfare in the recent past has recorded much valuable service by these vessels. During the recent Russo-Japanese war, for instance, 20 of these vessels, aggregating nearly 6,000 beds, both army and navy, official and private, transported the major portion of the 329,000 sick and wounded carried from the fleet and the shores of Korea and Manchuria to the home bases in Japan.[1] Similarly, during the siege of Port Arthur the Russian hospital ship *Mongolia* [2] in that port, although repeatedly exposed to shell fire, successfully shared in the care of the diseased and wounded, as did also the hospital ship *Angara* until sunk by shell

[1] See Reports of Military Observers, Russo-Japanese War. Lynch, p. 81.

[2] Nojine, E. K.: The Truth About Port Arthur, p. 193. Also Politovsky, E. S.: From Libau to Tsushima, p. 31.

fire during the bombardment of the fortress. While there appears to be little question of the value of these ships in connection with the care of the sick and the evacuation and transport of the wounded subsequent to an engagement, in what concerns their exact duties in relation to a fleet in action, and their position and movements with reference to the fleet during an engagement, great indecision still prevails. There is a tendency to look upon active intervention on the part of these vessels, except after an engagement, as a movement whose propriety is still wholly conjectural. Their activities during action are necessarily largely dependent upon circumstances that can not be foreseen, and their use in this situation will have to be a matter for the decision of the commanders in chief of the belligerent fleets. The views of a British writer may be quoted on this point:

Many conceptions as to the functions of hospital ships exist, and, in fact, these vessels have a very wide range of utility.

Their most successful work up to the present time has been: (*a*) In the transport of sick and wounded men either to base hospitals or home; (*b*) in acting as stationary floating hospitals in port.

These uses of hospital ships have been amply demonstrated in the wars of Great Britain and of other nations, and need little comment, but it must be noted that the experience gained by them has been mainly in land campaigns in connection with the army; hence it in no sense fully covers the important problem of the hospital ship in maritime warfare. In the experience gained by Great Britain such ships have been employed in connection with wars during which an absolute command of the sea has been enjoyed, hence the difficulties of transport and the risk of losing valuable officers and men by neutralization or as prisoners of war as a result of capture by the enemy have had no practical existence.

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Discussions have dealt with the provision of relief to sufferers in naval battles under two conditions: (*a*) During or after combats on the high seas; (*b*) during or after combats in proximity to the shore.

The second condition is the more simple; previous experience in the use of hospital ships is available, and any general provisions made by Red Cross Societies for shore work can be utilized. The subject therefore calls less urgently for consideration on this occasion than the first.

The problem of hospital ships on the high seas is vastly more complicated and difficult, while the various propositions made upon the subject at these conferences [1] and elsewhere have in recent wars, especially that between Russia and Japan, had the opportunity of some practical trial.

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To the hospital ship on the high seas two functions have been assigned:

(*a*) To act as "vessels of succor", to rescue shipwrecked men from death by drowning or by fire.

(*b*) To act as floating hospitals and as sick transports.

Ships destined to function in the first category may be dealt with briefly, since experience appears to indicate that the use of such vessels is chimerical, and the duties assigned to them can only be undertaken by sister vessels of war, and by these latter often only at great risk to themselves.

[1] International Red Cross conferences.

or act as an impediment to them. One officer refrained from expressing an opinion, owing to lack of personal experience.[1] Of the number stating a belief in post-bellum intervention, one qualifiedly held that in special instances when a ship was burning or on the point of sinking, and had therefore ceased to be of any moment to the engagement, active intervention was indicated as soon as possible.

Unfortunately past experiences in naval engagements may not be largely drawn upon to settle many of the mooted points connected with the operation of a ship of this class with a fleet, for while the hospital ship *Mongolia* followed in the rear of the Russians in the battle of the 10th of August, and the hospital ships *Orel* and *Kostroma* are stated to have been in the rear of the Russian fleet at Tsushima, and the Japanese hospital ships *Saikio Maru* and *Kobe Maru*, which were at a safe distance during that engagement, came up later, and were in a position to perform useful work, none of these vessels appears to have been in close association with the belligerents during the height of action.[2] Hence any dispositions adopted for governing such vessels under the circumstances of battle must be tentative only, based mainly upon theoretical grounds, and subject to such changes as may be dictated by the events of future naval wars.

In cruising formations of the fleet not accompanied by the train, the position assigned a hospital ship is usually well in the rear of column or line of the main body. With two or more columns as the formation, such a ship may take position in the rear of the columns on an alignment intermediate between the two or several columns, say at a distance of 1,600 yards. With the fleet in line abreast, a position in the rear of the right or left flank of the line or in the rear of its center may be the one assigned, the general principle involved being to have such ships so placed with reference to the main body that they may not be in the way of the fighting units in any maneuvers to be undertaken, and especially not be an embarrassment to any movement preliminary to or during engagement, and at the same time be where they may readily take any position assigned by signal or wireless or respond to a call for assistance in the shortest possible time. They should, of course, keep well away from lines of fire, and if they do enter the field of engagement, as stipulated by article 4 of the tenth Hague convention, "they act at their own risk and peril."

Should the fleet be accompanied by the train, hospital ships will be assigned a position well within the formation of the latter body.

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[1] Suzuki, fleet surgeon in *Mikasa*, flagship, has stated (p. 446, Journal Association of Military Surgeons, Nov., 1905) that, "except at the battle of the Yellow Sea, we had no need to send our wounded directly from warships to hospital ships. Our hospital ships were always stationed at the base during action. The Russians allowed theirs to accompany their squadrons, but unfortunately had little opportunity of availing themselves of their services."

[2] *See* No. 70 of Bibliography.

"If, for example, the approach of opposing fleets, which intend to fight, is always made from opposite directions, the position of the hospital ship will be easily arranged in advance and appropriate orders issued, but in the case of a hospital ship attached to the weaker fleet, which might seek to escape the stronger, care should be taken to see that the hospital ship in the rear of the escaping fleet is not left in a position of danger between two fires."

A hospital ship should not, of course, leave the position assigned without permission, unless the circumstances make that difficult to obtain and unless the security is plainly menaced.

Since a wireless outfit is now recognized as an essential feature in these vessels, and a comparatively high rate of speed will enable them to assume readily any position assigned, it might be considered preferable to place them simply within wireless call well to the rear and not in the close relation to the fleet previously mentioned, but if this matter is considered solely from a military viewpoint a position distant from the fleet would appear to be open to several objections. In a position distant from the fleet and in its rear, possible detection by the enemy's scout that had just missed sighting the main body would have to be considered. The heading, course, and, as previously mentioned, possible entries in the log of the hospital ship might well indicate to the enemy the general location of the fleet.[1]

The distinctive painting of these ships enhancing their visibility at night is of course an objection to their taking up a position in the fleet, but they will be required, when it is in force, to conform strictly to the order of "lights out." Only in circumstances of extreme danger, when the integrity of the vessel may be threatened at night by impending gunfire or torpedo attack, will it become necessary for her to reveal her identity in order to safeguard neutrality. The exact methods to be employed in rendering her special marks sufficiently plain at night will be the subject of discussion somewhat later in this paper.

The plenary power conveyed to a belligerent by article 4 of this convention, especially with respect to detention by the belligerent, should the gravity of circumstances in his opinion require it, is additional reason against assigning a position to these vessels out of support of the fighting force, if the latter, with engagement impending, is to have the services of its hospital ships when it most needs them, and not run the risk of having them diverted or held by the enemy, and, except for the objection previously noted, there appears to be every advantage in having them maintain a position comparatively near the main body.

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[1] *See* "hospital ships." Pickthorn, E. B., fleet surgeon, Royal Navy. Jr. R. A. M. C., May, 1908, p. 463

It is established that no position of a hospital ship in advance of the main body or in the van of the fleet may be considered without taint of suspicion. The incident of the *Orel* in the Russo-Japanese war already cited illustrates what penalty would attach to such position should it become known to an adversary, who through circumstances is free to exercise the right of seizure.

Should ships of this character once find a place with the fleet on the high seas and be in relation to the combatants during the engagement, the question then arises, With what duty shall they be charged, and what motives shall actuate their movements? There is substantial agreement to the effect that they should endeavor first of all to rescue those who are in imminent danger of drowning.

As a naval vessel is now rarely provided with an adequate number of boats to float the full complement, and since the number of boats will in war be reduced to the minimum, it would seem as if special means of rescue must be provided, if at all, from accompanying hospital ships. Beginning with the battle of Lissa,[1] in 1866, when many men were lost from the Italian ships by drowning, then again in the battle of Yalu, when a large proportion of the Chinese squadron went down, and finally in the action in the Sea of Japan, when the loss of men from the sinking Russian ships was enormous, the total mortality in naval battles has received its largest contribution from this cause, either from among those lost overboard and left floating or those carried down in a foundering ship. In fact, as before stated, this preponderating cause of mortality in naval actions operated originally to determine international agreement upon the means of rescue now afforded by the provisions regarding hospital ships in the Hague Convention. Of course, it is apparent that if a ship succumbs rapidly to torpedo or mine impact, or collision, no means of rescue will be adequate except possibly to save those few who may get clear of the sinking ship and support themselves by such adventitious means as may be at hand until picked up by a nearby hospital ship or other craft. Ships of war, should, if possible, have an adequate number of life rafts or individual life preservers disposed about the upper decks, and, if practicable, of such a nature as to be non-inflammable, or other devices should be at hand that give some chance of sustaining men afloat until they can be rescued. As already stated, in the battle of the Sea of Japan numbers of Russians were saved from drowning by the use of mattresses filled with cork which were placed about the upper decks. "Canvas bands were sewn on these

[1] In the battle of Lissa, out of 650 men on the *Re d' Italia*, over 500 were drowned. In the battle of the Yalu (on Hai-yang Island) the Chinese lost about 600, fully one-half of these being drowned. In the battle of Tsushima Straits, it is estimated that between five and eight thousand Russians were lost, mainly from drowning.

mattresses in such a manner that a man can slip one of them on and be in possession of an excellent life preserver."[1]

No certain dependence may be placed upon combatant ships for rescue under the circumstances of action, preoccupied as they are with fighting, and it still remains to be seen how far hospital ships may achieve success in this direction under the conditions imposed in this field of battle.

The rescue, care, treatment, and transport of the sick and wounded embracing the second class of duties devolving upon hospital ships, which may properly be designated under the military term, "evacuation of the wounded," in view of the extremely unfavorable conditions usually surrounding naval warfare, are scarcely to be executed without overcoming great technical difficulties, but since the military importance of evacuation, whether on land or sea, is a paramount one, it must be undertaken if possible. To disembarrass the fighting unit of its wounded after battle may constitute an urgent military necessity which seems to be adequately met only by the presence in the fleet of these auxiliaries. The difficulties inherent in this situation which may impede or greatly limit the activities of this specialized ship are those comprised in adverse weather or sea conditions preventing safe transfer of wounded, and in those conditions peculiar to battle in this situation.

Some of the difficulties surrounding this question have already been mentioned, and additional ones are indicated in the following quotation:

Between adversaries of equal strength, and considering the perfection achieved in gun practice, should two fleets engage at short range, we might reason that the action would be brief and violent, and a rescuing ship could be within easy reaching distance, but with a prospect of engagement at maneuvering range, the area of combat will be extensive and neutral ships will of necessity be well without the danger zone, and will readily enter it should they attempt to reach a vessel badly damaged or about to sink. It seems extremely probable that a commander in chief scarcely will be able to assign a position to a hospital ship, with action impending, that will enable it to be at one and the same time out of danger and within reach of a ship requiring its services. When, therefore, will it be permissible for a hospital ship to commence its activities?[2] One might say toward the end of the action. But what marks the end of an action? The hauling down of the flag and the complete surrender to the adversary seems to be the only criterion of this situation. Certainly as long as the flag flies, the adversary will not allow the approach of a succoring vessel. With surrender, the defeated are neutralized and a hospital ship might approach, but there is always the question of a renewal of engagement by other ships in the attempt to retake the captured ship. Considering all these points, it seems impossible to lay

[1] See Spear, R., surgeon, U. S. Navy: Sanitary Features of the Russo-Japanese War, p. 79. See also Makaroff, S. J., vice admiral (Russian Navy): Discussion of Questions in Naval Tactics, p. 183, par. 246 (Office of Naval Intelligence).

[2] In the International Red Cross conference of 1869, the suggestion was made that the hoisting of the yellow flag might be considered a signal for assistance, but it has failed of any official recognition.

down hard and fast rules by which the movements of this ship may be governed, and it may well happen that its activities may be required to be held in abeyance until the engagement is well over. One thing is certain, there is no more inappropriate place for a hospital ship than in the mêlée of a naval battle.[1]

(This article will be continued in the next issue of the Bulletin.)

IS GANGOSA A FORM OF SYPHILIS?[2]

By Surg. H. E. Odell, United States Navy.

When the United States acquired the island of Guam as a result of the Spanish-American war in 1898, one of the first things that attracted the attention of the American medical officers was a disease known locally as "gangosa" (Spanish for "nasal voice"). There was a goodly number of cases in the towns of Piti, Asan, and Agaña, the places most frequently seen. At Asan the Spanish had a hospital or reclusion station for the few lepers, and also in the same institution were confined those afflicted with gangosa. The horrible facial disfiguration of this last disease at once attracted attention, and in the first report made on the sanitary conditions and diseases of the island by Dr. B. A. Ward, United States Navy, he spoke of it as syphilis.

The old Spanish records are not available, and it is not known how the disease was considered by the Spanish medical officers, but at any rate if considered of a syphilitic nature it was not actively treated beyond the reclusion in the colony at Asan.

Dr. Ward's term of service here was short, and the quantity of medicine available at the time was inadequate to apply the therapeutic test for syphilis. Subsequent medical officers had concluded that the disease was not syphilis, and some had gone so far as to state that the chamorro, or the native, is immune to syphilis. This statement is absurd, as there is no such thing as racial immunity to syphilis. The disease exists in every race on earth that has had opportunity to become infected; in other words, it is among all people in this day. The idea of the chamorro's immunity to syphilis, however, seemed to have become firmly fixed, and upon my arrival the more active cases of gangosa, numbering about 60, were isolated in the same general compound as the lepers, at Tumon Bay, about 3 miles from Agaña. Those less seriously afflicted and who were more tractable were being treated at the native clinic in Agaña.

Upon first observing certain of these cases I felt sure, from the nature of the existing lesions and the scars of those healed, that syphilis was the cause of some of the cases at least. Those cases hav-

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[1] See Paschen, ante, p 424.

[2] Received for publication July 6, 1911.

ing the ulceration over the frontal bone, which was frequently involved, were so typically syphilitic that I ordered a certain number of cases placed upon mixed treatment of bichloride of mercury and iodide of potash. A similar number of controls, like cases, were treated as they had been before, by curettement, cleansing, antiseptic dressings, etc. In a short time it became evident that those taking the antisyphilitic treatment were rapidly improving, and the number of cases on antisyphilitic treatment increased. It was thought that some doubt might exist as to the nature of the ulcers on the legs and arms, as they resembled what is commonly described as tropical ulcers. Gradually the treatment was extended to those cases, with the result that all those afflicted with ulcers have been cured. The cases recluded in the Ypao colony were all released and permitted to go to their homes, but they are required to report regularly for observation and treatment at the out stations.

A card index was prepared of all cases known to have had or who had at the time any lesions. The age at onset, site of lesions, the length of time they had existed, results, date of beginning treatment, family relationship, etc., were given as accurately as could be ascertained.

The family relationship was at once apparent, showing a transmission from parents. It was very difficult to obtain any reliable data further back than one generation, but from information given by older intelligent inhabitants the disease apparently existed as we found it as far back as they could remember.

The total number known to have been afflicted to date and living is 338. Age of onset: youngest, 1 year; oldest, 84. Average age at onset, 25.7 years. The average length of time lesions existed before the present treatment was begun, 3.83 years.

Therapeutically, the condition having been demonstrated to be syphilitic in nature, 100 cases were taken, and the Wassermann reaction tried, with a result that 82 per cent were positive, 3 per cent slight, 15 per cent negative. Many of these cases had been taking the treatment for almost 1 year, and some of those that were negative were old cases that had had no open lesions for periods varying up to 20 years.

The treponema has been repeatedly searched for in the scrapings and discharges, in sections from the viscera of those who had had the disease and died, but so far the specific organism of syphilis has not been demonstrated.

It has been impossible to see the native when the disease is first manifested, but the condition, generally considered typical, begins as a small ulcer on the nasal septum, palate, or fauces, and at that stage is first seen. Its appearance does not suggest a preceding gumma, though typical gummata have been seen several times over

the tibia, and they have responded normally to the antisyphilitic treatment, not breaking down.

From the above-mentioned primary ulcerations the condition, when untreated, extends, destroying the soft and bony structures, producing the typical results so well known as common to syphilis, and from this came the nasal voice which gave to the condition the name "gangosa." These ulcerations frequently extended, involving the tissues of the face, eyelids, and eyes, and in healing, as they generally did after a time, the most horribly deforming scars were produced—eyelids fusing together, and the oral and nasal cavities being more or less united, frequently leaving as a result of the cicatricial contraction a small opening not more than three-fourths to one inch in diameter. On the extremities (the lower being more frequently involved) the ulcerations were more common about the hands and feet, and as a result of the ulceration and contraction, deformed and twisted members occurred. Ulcers existed on all parts of the body, usually going to sufficient depth to cause impairment of motion or loss of function. These conditions differ in no respect from what is frequently seen in cases of neglected syphilis, except that the neglect here has been greater, the ulcers having been allowed to take their own course unopposed, and when, in the course of time, healing took place the contractures and scars were correspondingly greater.

The time when the infection can be said to have become general, and the time of its introduction is so remote that no approximate statement can be made. This would be a very interesting point if it could be determined, and would show the length of time that syphilis can be transmitted. This island had a Spanish garrison for over 200 years, and Guam was formerly a winter resort for the Pacific whaling fleet with its scum of the water fronts of the world, so there is little doubt that the disease was introduced primarily many generations ago.

This is borne out in the fact that the native has outgrown certain conditions that we generally expect to find in those having syphilis. Pregnant women carry their children to term, and the children are as well developed and as free from deformity as the children of any other tropical people. Hutchinson's teeth and the other evidences of infantile syphilis are not seen at all.

The general stature of the people is said to be smaller than formerly, but this can be accounted for in several ways—the introduction during Spanish time of natives from the Philippines, the universal infection with hookworms with the corresponding drain upon the vitality of the developing child, and possibly the inferior feeding.

The mortality among the children is no greater than exists in the Philippines, and there has been a marked increase in the population since the United States began to do something to improve the general sanitation of the island.

The liver and spleen seem to be the only abdominal organs showing evidence of the disease, and in these organs gummata are seen. No amyloid degeneration has been observed. There have been several cerebral cases evidenced by paralysis, and interstitial keratitis is fairly common. Locomotor ataxia and paresis have not been observed. No chancres have been seen, and the disease is apparently not transmitted by sexual or other relations.

The Wassermann reaction has been tried on several blood relatives (brothers and sisters) of those afflicted, but showing no lesions, with positive results.

Much credit is due to Passed Asst. Surg. H. A. Garrison, United States Navy, for the efficient manner in which he carried out the preliminary treatment of the cases and obtained the clinical data for the card index, while to Asst. Surg. G. B. Crow, United States Navy, is due the credit for working up the Wassermann reactions, a report of which follows:

Index No.	Age.	Location of lesions.	Date when active.	Present condition.	Mixed treatment.	Wassermann test, March, 1911.
331	42	Nose and left hand. Tendency to break down.	1895–1910 1910	Healed	June 1, 1910	Positive.
297	18	Right leg Broke down	1906–1910 Feb., 1911	Healed Mar., 1911.	do	Do.
73	45	Nose and left cheek. Temple, elbow, and left hand.	1909–Nov., 1910 1908–Nov., 1910	Healed	do	Do.
427	46	Nose and palate	1875	do	July 1, 1910	Do.
320	43	Nose, palate, and lip. Left foot and leg	1895–1898 1888–1907	do	June 1, 1910	Do.
290	38	Arms and legs	1900–Oct., 1910	Broke down; improving.	do	Do.
175	38	Right leg Left leg	1905–1909 1905	Small ulcer left leg.	do	Do.
220	33	Right leg Left leg (amputated).	1908 1889–1905	Tibia badly necrosed; no other lesions now.	do	Do.
200	14	Nose	1908–Sept., 1910	Healed	do	Do.
177	15	do	1907–Sept., 1910	do	do	Do.
118	50	Feet and ankles	1900–Nov., 1910	do	do	Do.
314	60	Nose, throat, and knee.	1882–83	do	July 1, 1910	Almost positive.
325	40	Nose, left foot, and leg.	1900–1903	do	June 1, 1910	Positive.
326	52	Nose, throat, face, forehead, eyelids, and chin.	1895	do	July 15, 1910	Almost positive.
436	29	Lips and legs Left foot and toes	1887–1889 1905–1909	do	June 1, 1910	Positive.
492	48	Nose	1907	do	May 1, 1910	Do.
150	55	Forehead Throat	1902–3 July, 1910	do	Aug. 15, 1910	Do.
6	48	Nose and palate Broke down	1878–79 1907–8	do	June 1, 1910	Do.
215	45	Right hand Right knee and left foot.	1898–1909 1898	Recently healed.	do	Partial.

to the true value determined from observations are daily expected by the medical profession.

Returning to the first subject of discussion, that of the diagnostic value of salvarsan as shown by the immediate reactions following injections, a few preliminary remarks should be made. In the very first observations of the effects of salvarsan on syphilized rabbits and monkeys, a definite reaction was observed, and in all cases the therapeutic effect followed the subsidence of this reaction, and this has been the usual observation by all medical men in experimentation upon the syphilized organism. It has been noted in almost all articles upon the use and value of salvarsan that there is a repeated reference to the immediate systemic reaction following an administration of this drug as being unimportant and transitory. In several instances this was given as a direct contraindication for the administration, but it certainly is far-fetched in view of the positive good the drug does.

Can this reaction truly be said to be unimportant, and can we not, by giving some consideration to the occurrence of this phenomenon in following it out in a series of cases, make it of some apparent value at least? As able an authority as Neisser has made the statement that this reaction in temperature would be found in syphilitics and absent in nonsyphilitics.

The symptoms described as occurring in the reaction are numerous and variable, such as headache, dizziness, retention of urine, constipation, diarrhea, nausea, vomiting, erythematous or urticarial eruptions, Jarisch-Herxheimer reaction, chills, rise in temperature, diminution or acceleration of pulse, sweats, disturbance of vision, and various nervous symptoms. The ones most frequently observed, and occurring with the greatest regularity in the experience of this hospital, have been *rise in temperature* (to which the most importance is attached in diagnosis), headache, nausea, vomiting, purging, and various erythemata. It has been noticed that where emesis was severe, purgation was slight, and vice versa.

It is upon the presence or absence and degree of severity of the reaction that the conclusions of this observation have been drawn. A table formulating the observations upon the above-mentioned symptoms, so that each case would be given a parallel history in regard to the reaction, was made. As a result of these observations we believe that the reaction after the administration of salvarsan will diagnosticate the disease as syphilis, and that an absence of the reaction will be proof positive that the luetic infection does not exist, no matter how definite the history may be.

To make the point more explicit, take one of the indefinite cases which presents any one of the following symptoms: sore throat, tonsillitis of a mild or severe form, patches in the mouth, some one

of the various indefinite pains occurring in the joints or bones of the extremities, or headaches, which occur so often in syphilis; or take a case of early syphilis, in which the only sign is a sore on the penis and perhaps a slight inguinal enlargement with no other clue as to the etiology; in a word, any one of the various indefinite symptoms of syphilis; and we believe that a reaction after salvarsan will clear up the diagnosis.

In a series of 100 cases followed closely with this as a point of observation, it seems that this is proved.

In order to determine a value for this reaction, the following points were taken into consideration in each case: The history of the case, whether virulent or mild; duration; the previous mercurial treatment; length of time given, and whether it had been administered up to time of injection of "606"; if salvarsan itself had been given previously, the interim between injections was determined, and, lastly, the report of the Wassermann reaction. Taking up this series of cases and dividing them in reference to the foregoing group, we find as follows:

In 40 of the series the following data were determined. First, that a positive history of syphilis existed; second, that no mercury, or but small amounts, had been given previously, or that the mercurial treatment had been suspended some time before; and, third, that the Wassermann reaction was positive.

The reaction following the intravenous administration of salvarsan was in these cases, without exception, moderate or severe. By this I mean that the symptoms enumerated previously were present to more than an appreciable degree. Rise of temperature from 100.2° to 103° or 104° F., purgation more or less severe, emesis, headache, nausea, and perhaps an erythematous rash occurring in the first 12 to 24 hours.

In the next series of 32 cases the following data were elicited: First, that there was a positive history of syphilis; second, that mercury had been given for some time and in full amount up to the time of administration, or salvarsan itself had been given a short time before; and, third, that the Wassermann reaction was negative. In every case without exception the reaction was slight, consisting of rise in temperature not above 100.2° F. and only a mild demonstration of the other symptoms.

In 10 cases the following was noted: First, a positive history of syphilis; second, mercury had been given in full amounts up to and for some time previous to injection, or salvarsan itself had been given within a short time; and, third, in three the Wassermann reaction was positive, in the remaining weakly positive, and in each instance the reaction following the injection of salvarsan was slight.

The next 6 cases are of special interest as no history of syphilis could be elicited, and from further observation were undoubtedly not of luetic origin. Mercury had not been given in any instance. The conditions were as follows: Simple verruca, adenitis inguinalis of both groins in a Filipino and corresponding closely to the so-called "tropical bubo"; another case of adenitis inguinalis presenting no other symptoms; double chancroid; and lastly two cases of chancroids accompanied by suppurating buboes. In these last three cases no induration was present, the sores lasted a short time, and responded to local treatment. The Wassermann reaction in each case was negative, and after the administration of salvarsan in full dose no reaction whatever occurred.

Further, it may be stated that no improvement in the general condition or lesions present took place, the cases of adenitis inguinalis finally being operated upon and a rapid and good result obtained.

Four other cases present special interest in that they involve a peculiar fact relative to the Wassermann reaction, and that is that it is usually negative in incipient syphilis. Further comment on this will be made in conclusions upon the reaction.

In all cases the only symptoms present were indurated sores on the penis and slight enlargement of the inguinal glands. In two cases the sores were on the glans and in the others on the prepuce and two were of a duration of seven days, one of eight days, and each gave incubation periods of three weeks.

In each instance the Wassermann was negative, but the reaction to salvarsan was severe and the therapeutic effect immediate, all sores healed in from 10 to 15 days, and the improvement in the general condition was just as pronounced.

To emphasize the point in regard to the Wassermann reaction and at the same time the reaction to salvarsan, another case will be cited in contrast to the other cases of incipient lues. An indurated sore had existed on the penis for three weeks, general glandular enlargement was appreciable, and the incubation period corresponded to that for syphilitic invasion. The Wassermann was twice positive and the reaction to salvarsan was severe. The sore immediately improved, as did the general condition.

This same case returned to the hospital within a period of two months, and this time general adenopathy, sore throat, ulceration of both tonsils, and a high temperature were present. The Wassermann test was still positive and the reaction to salvarsan severe. No treatment had been given in the interim, and the response to the second injection in its therapeutic effect was even more rapid than to the first.

Eight cases remain of this series and in these we find the only deviation from the usual results. First, all were of undoubted luetic

origin; second, all cases except one had received the mercurial treatment previously with more or less regularity, in three "606" had been given; and third, the Wassermann reaction was negative. Nevertheless the reaction to salvarsan was from moderate to severe.

One of the cases which had recieved "606" previously was of a very virulent type and had had mercurials to the extreme point of toleration with no effect. The result from salvarsan was wonderful, the lesions which had persisted for months disappeared in a few weeks. The first injection of salvarsan was small, 0.3 gram being given.

Another case in which "606" had been given previously was one in which syphilitic periostitis of both tibiæ existed. In this connection it may be observed that syphilitic bone lesions have the same property as early chancres; that is, the production of a negative Wassermann reaction.

Another case was one of chancre accompanied by necrotic inguinal glands. The Wassermann reaction previous to the first injection of salvarsan was positive and the salvarsan reaction severe. The chancre improved immediately as did the enlarged glands, but after a period of 17 days the glands began to break down and a second injection of "606" was given. The Wassermann reaction preceding this injection was negative, but the salvarsan reaction was moderate and the therapeutic effect beneficial.

In the other cases the history of syphilitic infection was positive and of long duration, mercurials had been given but not for some time previously, and although open lesions existed—i. e., mucous patches in the mouth and throat in each case—the Wasserman reaction was negative. The reaction to salvarsan was severe and the therapeutic effect beneficial without exception. The negative Wassermann reactions may have been due to the fact that the treponema pallidum is frequently absent in the late and malignant lesions of syphilis.

Whether there was an error in the Wassermann reaction or a mistake in the interpretation of the reaction to salvarsan is also a question, but there are exceptions to all rules and this may be one of them. Should no mistake have been made, the value of the salvarsan reaction can be appreciated by these negative Wassermann reactions in the face of a positive history.

In conclusion, upon the recital of cases, one more case presented itself so strikingly in showing the relation of the Wassermann test and the salvarsan reaction that it deserves special mention.

The case was referred to this hospital by the medical officer from one of the ships, and gave a positive history as to syphilitic infection which had occurred several years previously. The symptoms present were enlarged glands of both groins which had been incised in several places and drained and a yellow serous discharge came from both. The penis and scrotum were increased enormously in

size from edema and this was thought to be due to the interference with the venous circulation by the swollen glands. Wassermann reaction was twice negative. Nevertheless, increasing doses of potassium iodide were given and with astonishing results. The penis and scrotum showed almost immediate improvement in the edematous condition and the swelling of the glands promptly subsided. This treatment was continued for a period of two months. Mercury was omitted during the entire time, as it had been given for a long time previous to admission with indifferent effect.

In view of the positive history of the infection, it was decided that salvarsan should be given to note its effect. At the time of administration of the drug another Wassermann reaction was taken, which was positive. Contrary to all expectations the reaction to the "606" instead of being slight was severe. The case strikingly shows the relations between the salvarsan reaction and the Wassermann reaction.

Therefore it seems that there is some relation between the reaction to salvarsan and the existence of syphilis in the human body; and that given an obscure case with some ailment, supposedly syphilis of indefinite history, and unrestrained by treatment, a reaction to an intravenous injection of salvarsan may be diagnostic as well as therapeutic.

Salvarsan is claimed to be parasito-tropic to the treponema pallidum. Mercury is acknowledged to be parasito-tropic to this same spiral organism. It is possible that in these facts we may be able to determine the cause of the reaction. Other factors must also be given consideration, as it has been suggested that this reaction may be due to the too rapid flow of salvarsan solution during administration, and again it has been pointed out that it may be due to some defect in technique. These are hardly worth consideration in view of the fact that the reaction is recognized as a general occurrence by the medical profession. In this hospital, observations of the above suppositions have given little satisfaction in regard to an explanation, as results, contrary to those expected, have been observed.

The three factors which seem worthy of consideration and differentiation in this regard are these: The action of the drug itself, which by weight is 32 per cent arsenic; action of the drug upon the treponema pallidum, destroying them and liberating the endotoxins which produce this momentary toxicity and perhaps increase metabolic processes before their final elimination; and the process of neutralization of the toxins in the circulation, which exist in the body and are being continuously produced by the treponema.

The fact that the reaction is absent in nonsyphilitics would exclude the supposition that it is due to the toxicity of the drug itself. As a result of the observations in these 100 cases, it seems probable that

the reaction is due to a combination of two factors, namely—the destruction of the treponema liberating the endotoxins and the neutralization of these same endotoxins and the toxins which already exist in the body. To the first, primary importance should be given, the treponema being the prime factors. They are undoubtedly irritative in some way to the tissue in which they exist, as evidenced by the infiltration of cells in the lesions. Whether this is due to their mere presence or the irritant toxins they produce is still conjecture.

It is reasonable to believe that the salvarsan reaction is due to the action of the drug upon the endotoxins and toxins and is produced until their final elimination or neutralization takes place. The reaction in temperature and general incapacity certainly subsides after the phenomena of sweating, vomiting, and purging have been established.

The presence of the toxins and endotoxins in the body is in direct relation to the number of spirilla in the body and the number destroyed by the action of the drug. This condition in turn is in direct relation to the mildness or severity of the infection or the condition of the disease, restrained or unrestrained by treatment.

Let us repeat that in all cases where the disease had none or very little treatment previously, the reaction was severe. In almost all cases where treatment had been full and continued up to the time of injection, the reaction was slight, and in cases where syphilis did did not exist no reaction occurred. Therefore there is an inverse relation between mercury and salvarsan in the production of the reaction, and it can most unreservedly be said that the reaction itself is due to the presence of the treponema, and to that alone, as it exists in the body unrestrained or restrained by previous treatment.

Syphilis does not immediately infect the general circulation. This has been proven by the absence of the positive Wassermann reaction in the incipient stage, for it is only where the sore has been of some duration or the secondary symptoms have made their appearance that it becomes positive. This is probably due to the intense infiltration of cells surrounding the chancre producing the induration which acts as a momentary barrier to the passage of spirilla or their toxins, at least not in sufficient number and amount to produce a positive test.

The organisms finally increase to such a number that they either penetrate this wall or by their own irritant action and that of their toxins partially dissolve it and the disease becomes a general systemic one. Salvarsan has the property of penetrating or dissolving this wall, or both. The improvement in the chancres in this series of cases has been noticeable and immediate, although the final heal-

ing in some instances slow. It has been reported by others, and has occurred in the experience of this hospital that in many cases a negative Wassermann observed before injection became positive afterwards, which would give color to the explanation that salvarsan had a dissolving influence on the chancre, thus liberating a number of treponema into the general system, which escaped its germicidal action.

In several of the cases observed the chancres were of such short duration that the Wassermann was negative. Nevertheless, the reaction to salvarsan, by virtue of this dissolving or penetrating power to reach the treponema was severe and the therapeutic effect immediate. Therefore it seems possible that this reaction is diagnostic before a positive Wassermann can be obtained.

It is possible that the theory of destruction of the treponema, liberation and neutralization of the toxins will explain several of the various phenomena occurring in the reaction.

In explanation of the phenomena of the eliminative processes found in the reaction to salvarsan we may advance the theory that it is due to the neutralization of the toxins and endotoxins, or that new toxic substances are formed, which act on the individual nerve centers, or that it is the natural reaction of the body to rid itself of these poisons.

In the Jarisch-Herxheimer reaction, as well as prior to its appearance, the spirilla and their toxins exist in the eruptive spots. Salvarsan attacks these spirilla through the medium of the circulation, and in the reaction that follows its injection, in the course of the destruction of the spirilla and the neutralization of their toxins and endotoxins, there is an increased congestion and inflammatory condition of the spots. In every case in our series where there was an eruption this congestion was present, varying only in degree.

The various erythemata are attributed to the neutralization of the toxins and endotoxins in the finer capillaries of the skin.

In some instances an eruption occurred following the injection, which was probably due to the fact that the treponema and toxins existed in the skin, but not in sufficient numbers to produce a rash or eruption, and by the injection of salvarsan the congestion and reactionary inflammation was increased by the treponema and toxins, these being present in greater numbers in small localized areas of the skin and produced an eruption spot at each area.

Another significant feature noted in the reaction is the immediate effect of salvarsan in bone lesions (syphilitic periostitis). Pain which existed in the lesions to the extent of disabling the patient from movement of a part or parts increased greatly in intensity a few hours after injection, but after the eliminative processes began they disappeared entirely and the lesions rapidly improved. This can be

explained by the action of salvarsan upon the treponema, endotoxins, and toxins, causing an intense momentary congestion of the bone and, being under a tension, increases the symptom of pain. After their elimination it would naturally subside.

Returning to the reaction *per se*, in a series of 20 cases of syphilis, either questionable or positive in history, a Wassermann reaction was taken coincidently with the injection of salvarsan. The reaction was observed and conclusion drawn as to what the return of the Wassermann test would be, and in each instance the fixation test returned as predicted.

In all cases the therapeutic effect upon the lesions acted as a check for the reaction, and in no instance was there a contradiction of these two observed points.

Still another feature in regard to the reaction was noted in cases of necrotic specific bubo, which was that the reaction either persisted for several days or made a reappearance on the second or third day. The immediate reaction was probably due to the action of the drug upon the unprotected protozoan spirilla in the superficial lesions and general circulation and the reappearance to the drug attacking collections of spirilla secreted and protected in the glandular structures.

Passing from this recital of observations and comments, what conclusions can be drawn as to the practical value of this reaction, what advantages may it have if it proves trustworthy, and what objections can be offered to its use in this way?

The diagnosis of syphilis in this day of scientific medicine is easy if we have the facilities at hand for the various blood tests, such as the Wassermann or Noguchi reaction, and it is not difficult if we have all the typical symptoms, but many times there are none or only an indefinite history of the disease and the Wassermann or Noguchi tests in many instances are beyond the reach of the physician who desires to use them to confirm his diagnosis.

Of course, we have the india ink method for staining the treponema, and it is a simple procedure, but one needs practice and experience to be able to find and differentiate the organisms.

Salvarsan is within the reach of every physician, and there is no medical officer who is not capable of administering it.

There is undoubtedly a relation between the reaction of salvarsan and the Wassermann reaction, with few exceptions, and in such instances where the blood test can be made the reaction would serve as an adjunct in determining the diagnosis, and, further, the reaction may be diagnostic when the Wassermann reaction is negative.

Whether the reaction will always be present in incipient syphilis, if untreated, remains to be seen, but in the cases in this hospital it

has not failed in any instance. The Wassermann reaction usually is negative in the early stage of the chancrous sore, and the value of the salvarsan reaction can readily be appreciated if it is really earlier in its diagnostic power than all other tests that have been described up to the present time.

Small doses of salvarsan, such as 0.25 grams, act just as well in the production of the reaction in untreated syphilis as maximum doses, and in view of the late improvement in the method of administration by the Schrieber syringe, nothing more convenient could be desired for diagnostic purposes.

Lastly, the therapeutic effect that is produced at the same time is a matter of no small importance. It is one that would be a long-sought-for friend to the physician, in that he needs no excuses for its introduction, for he administers it to his patient for its therapeutic effect and at the same time satisfies his own mind as to the diagnosis.

In looking for disadvantages in this method, do we really have any in considering the therapeutic good it does?

Certain protozoan diseases, as framboesia, sleeping sickness, and in the paroxysms of malaria, a reaction to "606" may be observed, as the Wassermann reaction has been found positive in these diseases, but nevertheless their rarity in this country at the present time in comparison to the prevalence of syphilis is marked, so that little confusion could be expected from these diseases.

Optic neuritis is reported to have occurred and undoubtedly eye symptoms do occur after large doses of arsenic, but there is little conclusive proof that salvarsan will produce optic neuritis in a normal eye.

No such ill effects were noted in any of the cases treated in this hospital. Lesions of the cord and brain, lesions of the ear, and almost every untoward subsequent symptom has been ascribed to salvarsan, but the literature on the subject of "606" is noticeably void of any long recital of cases in which it has been directly harmful if used properly and with moderate care.

Sir Johnathan Hutchinson cites cases and literature indicating that the administration of arsenic creates a proclivity toward malignant forms of growth and describes it as "arsenic cancer."

At present a case of optic atrophy is under observation in this hospital. Two injections of salvarsan had been given two months ago in the naval hospital, Norfolk, Va., and the Wassermann reaction at this time is negative; nevertheless, it is possible that the lesions existed prior to injection and were syphilitic in origin, so that the action of salvarsan on the treponema in the nerve tissue caused a congestion and reactionary inflammation which, not having been treated, did not subside, but became progressive.

We therefore believe that the reaction to salvarsan should be given due consideration, and although the observations given here by no means make it positive proof, as it is only by long experimentation that that can be obtained, it certainly suggests itself as an occurrence well worth watching which may some day prove of value. The observance of the phenomena in relation to the drug salvarsan has been too common and had knocked at the door of the medical profession too often already to still be given meager consideration and spoken of as being transitory and "unimportant."

AS A THERAPEUTIC AGENT.

We wish to preface our remarks on the therapeutics of salvarsan by saying that we believe it has come into the field of medicine to stay, for its value in the treatment of syphilis can not be doubted. It has filled a need which has long been felt, for by its rapid action on the so-called "open lesions" it has reduced the number of sick days at least 50 per cent, and probably more when accurate statistics have been taken.

In 40 cases of syphilis treated with salvarsan the total number of sick days was 611, and in 40 cases treated with mercurials and the iodides the total number was 2,270. The cost of maintenance and subsistence in this hospital [naval hospital, New York] averages $1.04 per patient per day, hence the amount saved in comparison to those treated with mercurials and potassium iodide was $1,621.36. This does not include pay received while on the sick list or take into account the cost of filling the vacancy caused by the patient. But the enormous economic value of the drug to the service is apparent from these figures.

In the beginning of the use of the drug in this hospital many cases were on the sick list which were very resistant to mercurial treatment, but after the injection of salvarsan the condition of "fit for duty" was quickly attained.

The preparation of the drug for intravenous administration is stated to be tedious and difficult, but it is a simple procedure and, with reasonable amount of care and proper technique, can cause no danger to the patient.

The method used in this hospital is the "mortar and pestle" method, and it is needless to say that all aseptic precautions are taken in both preparation and administration. This method is as follows: The ampule opened, the contents, 0.6 gram, are emptied into a glass mortar, and to this 23 drops of 15 per cent sodium hydrate solution are slowly added, stirring with pestle at the same time to aid solution, and continuing until as much as possible is dissolved, which is usually all but a very small amount. Forty to 50 cubic centimeters of normal saline solution are then added, stirred, and filtered.

If any undissolved particles remain, care is taken not to run them out of the mortar, and with the addition of a small amount of saline solution and manipulation with pestle they are dissolved also, and solution passed through filter. The required amount of saline to make 300 cubic centimeters is then added. In no instance was an ampule spoiled and the solution made unfit for use. It has been found that to have the saline solution luke warm facilitates the procedure by causing the drug to go into solution more rapidly and making a clearer yellow color.

The ordinary saline tablets are used in the preparation of the normal saline solution.

The solution does not always require filtration, but it is always the safer procedure and is very little trouble.

Finally the solution is tested with litmus and is usually neutral or slightly alkaline, and this is the desired reaction. The method of administration in these cases has been by intravenous injection, for after giving careful consideration to the methods used and effects produced in the use of salvarsan by others, it was observed that this method gave the best results. It certainly is as efficacious and rapid as any and does away with all the untoward local effects of the intramuscular and subcutaneous injections. The Schrieber syringe has been used in several cases, but the veins must be large and prominent and in the end the intravenous method is the most convenient.

Local anæsthesia has been used in the majority of cases, but many have been treated without it. A small injection of a 2 per cent solution of cocaine, injected subcutaneously, quiets the fear of the patient and makes the procedure easier and there is no contraindication for it.

No routine relative to the vein used was carried out, the one giving the easiest access being the one taken, and in several instances it was given in the wrist with no accompanying difficulties.

An incision one-fourth of an inch long has fulfilled all purposes in nearly all cases, and it has been deemed best to make as small an incision as possible, as it leaves a permanent scar and one which, to the awakening laity, would carry its significance. In many cases a slight congestion and inflammatory condition was noted at the point of incision after injection, which was probably due to the irritant action of the drug.

In considering its effects upon the disease we will deal only with those cases in which the previous salvarsan reaction has been noted. Salvarsan has been given subcutaneously, intramuscularly, and intravenously, but the latter method seems to have been the best method in the hands of all physicians.

The dose has been variable. In the first injections small doses were given, as 0.25 to 0.3 gram, but now the full dose of 0.6 gram is stated as the correct therapeutic maximum and it gives good results.

Chancres and buboes which existed at the time of injection showed improvement in three to six days, which was significant in the formation of granulations. The more virulent type of the Hunterian chancre improved more slowly, induration persisted for several days after the sore had entirely healed. The inguinal adenopathy showed slow improvement, but those which had been incised healed more rapidly. The open treatment for chancres was used in all cases, and showed a decided improvement when properly carried out. The sores healed in from 8 to 30 days.

Here it is desired to call attention to the character of the chancre. It is claimed that in the early stage the wall of the sore is so infiltrated with cells that the treponema can not gain access to the general circulation. It is evident, therefore, that general systemic infection occurs after resolution of this wall, or multiplication of the spirilla to such an extent that they penetrate it.

It has been noted that in cases of recent infection where the Wassermann reaction was taken within 7 to 9 days after the first appearance of the sore, it was negative, but the therapeutic effect of the salvarsan was always pronounced.

It seems possible that very few uncomplicated chancres exist and that a majority are a mixed infection, although that infection may be very mild.

Several cases of mixed infection have occurred in this series, as after the injection of salvarsan very little or no improvement occurred until the local antiseptic measures were begun, but the improvement in the general condition, such as disappearance of anemia and gain in weight, was marked.

Mucous patches improved in 1 to 2 days and disappeared in 3 to 10 days. The effect upon the eruption was somewhat disappointing in its ultimate result, for although in all cases it showed a tendency to fade in a few days, the final disappearance was slow. The roseolar syphilide disappeared much more rapidly than the macular and papular forms, the first disappearing in 4 to 6 days. A feature relative to the last two was a slight pigmentation of the eruption spots which remained for a variable length of time.

Sore throat showed improvement in from 1 to 2 days and pain that existed was relieved in the first day and disappeared by the second. The earliest relief from pain was within 2 hours after the injection. The congestion usually disappeared in 4 to 6 days.

Two cases of rhinitis of the most intense type disappeared in 1 day. Salvarsan apparently affected the symptom of sore throat more rapidly than all others, the effect probably being due to the neutralization of the irritant toxins.

Ulcers and abscesses, and in this ulceration of the tonsils is included, began to improve on the first to the third day and in the milder cases they even disappeared in 4 to 8 days.

In one case severe ulcers of the face involving the entire nose and a number on the cheeks, neck, and forehead healed in 18 days, while in this same case mercury had been given previously to the extreme point of toleration with no effect.

Glandular enlargement was the commonest symptom found and invariably showed slow improvement, but it was noticeable that the more pronounced the enlargement the more appreciable and rapid the effect of the treatment. Enlarged glands of the anterior cervical chain and accompanying sore throat showed the most improvement. In 5 cases they disappeared entirely in 5 to 10 days.

Bone lesions healed rapidly and the disappearence of preexisting pain was the prominent feature. Two patients who were unable to walk prior to injection were able to go about on the third day after injection with no discomfort.

Elevated temperatures that existed prior to injection and were due to the syphilitic infection became normal in 2 to 6 days.

The increase in weight, the disappearance of anæmia, and the rapid change from the dull, stupid incapacity with headache to one of renewed vigor was as phenomenal as the disappearance of the lesions themselves.

Headache, which in many cases was the only symptom of the disease present with the exception of a positive Wassermann reaction, in many instances entirely disappeared and was always partially relieved by salvarsan.

The last-mentioned type are the typical cases for diagnosis by salvarsan. Four such cases existed in the previously mentioned series. The only signs present were headache, a positive history of syphilis, and a positive Wassermann reaction. The reaction to salvarsan was severe and the therapeutic effect beneficial. Many times a slight fullness of the head has been complained of after injection, but this was probably due to the increase in arterial tension which occurred momentarily after injection.

Condylomata disappeared in 10 to 14 days.

In regard to the Wassermann reactions they were taken in all instances prior to the injection of salvarsan, but were not taken following the injection, as the men became ready for duty in such a short time that it would have been of little practical value. In those cases where the disease was malignant in type and required further treatment the observations in regard to the Wassermann reaction were carried out.

One case was admitted with a sore on the penis and enlarged inguinal glands and gave 2 positive Wassermann reactions, taken 8 days apart. Salvarsan, 0.6 gram, was given and a severe reaction followed, the sore healed in 16 days and the patient was discharged to duty. Fifty-four days after the injection of "606" the same patient

was readmitted with sore throat, ulcerated tonsils, marked glandular enlargement, and high temperature, and the Wassermann reaction was still positive. The symptoms quickly disappeared after a second administration of salvarsan and although mercurial treatment had been advised upon his discharge the first time none had been given in the interim.

The cases in which the Wassermann test was made after injection gave results as follows:

One negative before injection; negative 26 days afterwards.
One negative before injection; negative 27 days afterwards.
One positive before injection; positive 54 days afterwards.
One positive before injection; positive 14 days afterwards.
One negative before injection; weakly positive 39 days afterwards.
One positive before injection; weakly positive 11 days afterwards.
One negative before injection; negative 19 days afterwards.
One positive before injection; weakly positive 19 days afterwards.
One negative before injection; negative 11 days afterwards.
One positive before injection; positive 11 days afterwards.
One negative before injection; negative 11 days afterwards.
One weakly positive before injection; negative 10 days afterwards.
One weakly positive before injection; negative 11 days afterwards.
One positive before injection; negative 18 days afterwards.
One negative before injection; weakly positive 18 days afterwards.
One weakly positive before injection; negative 41 days afterwards.
One positive before injection; weakly positive 18 days afterwards.
One weakly positive before injection; negative 17 days afterwards.
One weakly positive before injection; negative 10 days afterwards.
One positive before injection; weakly positive 14 days afterwards.
One negative before injection; negative 14 days afterwards.
One positive before injection; positive 11 days afterwards.
In two other cases one was positive 2 months after two injections of "606"; in the other negative 2 months after two administrations.

It is evident that the Wassermann reaction does not follow any set rule in all cases, for in several instances where it was negative previous to injection it became positive afterwards. Mercury undoubtedly has greater power and is more rapid in the production of a negative Wassermann reaction than salvarsan and further, when the fixation test has become negative, it is more prolonged after the administration of mercury. It has been noticed that although the reaction after a second injection of salvarsan was slight, the Wassermann reaction was positive the same as it was previous to injection or that it became weakly positive. Cases in which a weakly positive reaction was noted at first test it usually became negative afterwards.

Now, how much good does salvarsan do and can we draw any conclusions as to its true worth therapeutically? To the first we answer unhesitatingly that it is of the utmost value to the medical profession in the treatment of syphilis and one that will be a potent factor in the final elimination of the disease as a venereal scourge.

One injection of salvarsan in a case of syphilis, whether malignant or mild, is certainly indicated and always justifiable no matter what other lesions or contraindications exist. It is also a proof that in the most virulent forms the most brilliant results are achieved.

There is very little to be gained by the second full injection of salvarsan given within a short period of time following the first injection, for it has been observed that after the second administration no beneficial results are obtained that are not derived from the first one, and in many instances symptoms, such as headache, persistent diarrhea, and general malaise made their appearance after the second injection that did not exist before. That one injection does not cure and that a second should be given and even a third is without question; nevertheless it should not be used without reason, but with discretion and from indications which present themselves in the state of Wassermann reaction and the condition of the lesions found in each individual case.

If one injection does not cause the open lesions to disappear, a second injection, but a much smaller dose, as 0.25 gram, within a period of 12 or 15 days, will usually suffice to control the symptoms. This followed by a course of mercurials for a period of two months and a Wassermann taken; then a third injection of salvarsan, 0.6 gram, would be justifiable. The mixed treatment of mercury and potassium iodide is the indicated treatment from this point for a period of four months and then another Wassermann taken. If negative, treatment may be suspended and observation continued by a Wassermann test every two months for a period of six months, and if it is still negative at the end of that time there is good reason to believe that a cure has been accomplished.

If at the end of the four months the Wassermann is positive, a fourth injection of salvarsan should be given and treatment continued for four months longer; thereafter the same course previously given pursued. If any of the succeeding Wassermann tests are positive, treatment should be recommenced immediately.

It is true that such a course of treatment is hardly practical in the naval service, as the men are sent to duty and in places where such treatment can not be carried out. In view of this fact, a second injection in a short but reasonable length of time can be given.

It is to be regretted that in the United States naval service, although every medical officer appreciates the value of further mercurial treatment and that salvarsan does not cure syphilis at least in one dose, that in many instances no mercurial has been given upon the advice given in the health record. Several cases have been sent from this hospital in which salvarsan had been given and no open lesions existed at the time of discharge; these same cases returned after different periods of time, in which lesions were again present, but no treatment

or a very small amount had been given in the interim. Several cases have come from other hospitals in which the same conditions were noted.

Syphilis can not be cured in a day, neither can a man be blamed if he does not continuously seek treatment when he has a day of labor before or after him, and it certainly behooves the medical officers as physicians at least to follow up the treatment for the sake of humanity if not for the sake of their employer, the United States Government.

Recurrences of the open lesions of syphilis appear and will continue to occur after the administration of salvarsan in one injection and after two injections, if no other treatment is given. This has been the experience of this hospital and many other hospitals, and the statement can not be repeated too often and too forcibly that salvarsan alone does not cure—at least the ordinary type of infection—and must be aided in its admirable therapeutic effect by its co-worker, mercury.

In conclusion the writer wishes to thank Surgs. N. J. Blackwood and C. M. Oman, United States Navy, for their valuable assistance and kind encouragement in this work, and to Passed Asst. Surg. F. M. Shook, United States Navy, and Dr. M. C. Pease, of the New York Post Graduate Hospital, for the determination of the Wassermann reactions. Also thanks are due to Hosp. Steward A. Knecht and Hosp. Apprentice (first class) J. A. Harris, United States Navy, for their assistance in the preparation and administration of the drug salvarsan.

FLAT FOOT AND ITS RELATION TO THE NAVY.

By Passed Asst. Surg. R. G. Hemmer, United States Navy.

A review of the causes of discharge for disability from the United States Navy and Marine Corps during the year 1910 shows that flat foot is second in number, and that the only disease which caused a greater number of invalidings from the service was tuberculosis. The amount of damage from flat foot is large, and it will be seen that there is a marked increase in the past few years.

In the writer's experience the large majority of flat feet are found in recruits in the United States Marine Corps when they are reexamined at the various barracks after their arrival from recruiting stations. In many recruiting offices the applicants for enlistment are examined by civilian physicians, many of whom do not appreciate service conditions. A man otherwise physically sound is considered a good recruit but the pain due to flat foot develops soon after the drills begin and can not be traced to any act of duty or injury in the service.

The object of this article will be to emphasize the necessity for careful examination of the feet of an applicant for enlistment, to

show the poor results of treatment of flat-foot cases when they are in the service, and to describe a method of examining which will detect the weak, low, or fallen arches of the feet.

Flat foot, weak foot, or talipes valgus (which is included under the head of flat foot by some authors) is a dislocation of the tarsal bones resembling any other dislocation except that it is not so acute. The head of the astragalus is rotated inward; the scaphoid, cuneiform, and proximal end of the first metatarsal are moved downward and inward, and the front end of the os calcis and cuboid follow the astragalus to the inner side. There is a dropping of the middle of the foot with an outward deviation of the front of the foot. Pain is due to pressure by the displaced bones on nerves and tissues, to the stretching of ligaments, and to reactive inflammation. Spasms of the muscles also occur.

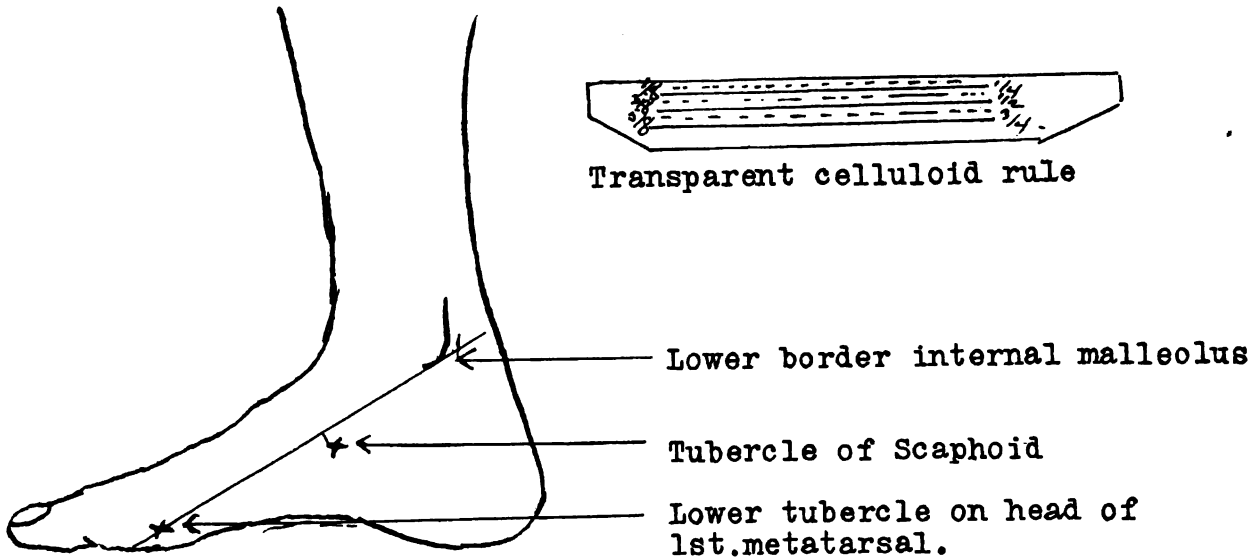
If an individual with normal feet stands with both feet together, pointing forward, the weight on each foot will fall midway between the outer and inner edge; that is, there is no turning outward of the ankle. The inner contour of the foot shows no bulging at the scaphoid tubercle, and is a straight line to almost the end of the great toe. Now, if this individual stands on one foot, making the superimposed weight excessive, you will notice that all the toes are pressed firmly against the floor, the arch lifted and the foot inverted. This action is accomplished by the tibialis anticus, the tibialis posticus, the flexor longus digitorum, the flexor longus hallucis muscles, and also the muscles of the sole of the foot. Cases in which there is a weakening or loss of tone of these muscles show a turning outward of the ankle, a dropping of the scaphoid tubercle, and a falling of the arch.

The deformity, strictly speaking, is not a flattening of the foot, but it is an exaggerated mid-tarsal drop and twist with an outward deviation of the front of the foot.

There is necessarily a variation in the relative prominence of the different factors of the deformity in individual feet. For instance, the inward movement of the mid-tarsus may be characteristic of some cases; the dropping of the arch or the abduction of the front of the foot may be present in others.

The foot of the infant is apparently flat, as is that of the savage. In the former it is due to the protecting pad of fat which nature has provided to sustain the arch, and in the latter to the excessive development of the plantar muscles. The ordinary method of taking footprints does not give us the true idea of the height of the arch, because one may have an ideal foot with a perfect arch, and the well developed underlying foot muscles will cause the imprint of a flat foot.

The method of routine foot examination which I wish to suggest is taken from an article by H. O. Feiss in the American Journal of Medical Sciences of August, 1909, and briefly is as follows:



THE EXAMINATION FOR FLAT FOOT. BONY LANDMARKS AND TRANSPARENT RULE USED.

If one examines a foot the three following bony landmarks are prominent and easily defined: (*a*) The lower tubercle of the head of the first metatarsal; (*b*) the tubercle of the scaphoid bone; (*c*) the posterior-inferior corner of the internal malleolus.

In order to make the proper observations a standard method of examination is applied. The subject stands with one foot on the floor and the foot to be examined is placed on the seat of an ordinary chair in such a position as to have the leg vertical and the knee and hip flexed at about right angles.

The weight of the body is chiefly transmitted to the foot resting on the floor. In this way the foot can be examined in a definite and uniform position without bearing much weight.

The bony points above mentioned are marked with a blue pencil and a thin transparent celluloid rule provided with a scale is applied so that its upper edge coincides with these marks on the head of the first metatarsal and lower edge of the internal malleolus. The distance of the tubercle of the scaphoid from this upper edge is read through the transparent rule by means of the scale. (See illustration.)

The average distance of the tubercle of the scaphoid from a line connecting the internal malleolus with the lower tubercle on the head of the first metatarsal was found to be one-half inch in a series of 100 normal men, of an average age of 21 years.

The table shows that there are only nine cases in which the tubercle was less than one-quarter inch below the line and only four cases in which it was more than three-quarters inch below; therefore the great majority of cases show the tubercle depressed from one-quarter to three-quarters of an inch.

The next question is, What kind of a foot are we to use on which to base the estimation of deformity? The problem is not what is the average but what is the extent of variation which we have a right to expect in the normal physiological foot. There can be no doubt that the foot in which the tubercle is near the connecting line is better than the foot in which the tubercle is 1 inch below it, the scaphoid being the key to the arch of the foot and the other two points given the bases of the arch. It seems, therefore, that other things being equal, the higher the scaphoid tubercle the greater the efficiency of the foot. By the other things being equal I mean abduction of the foot, eversion, and prominence of the internal contour.

A slightly lowered arch without bulging of the internal contour, eversion, or abduction will be a far better risk than a high arch with the above mentioned deformities existing.

Why not adopt as an arbitrary limit of depression of the tubercle of the scaphoid, one-half inch, and rejecting all feet below that standard, noting on the figure chart of the enlistment record the distance of the tubercle below the connecting line? This would enable

an estimate of the exact amount of damage a foot has sustained from the time of enlistment.

TREATMENT OF FLAT FOOT.

The percentage of admissions that are invalided from the service shows how little we can do for flat foot.

If it were feasible from an economic point of view, that is, if we could keep these cases away from duty long enough to carry out the appropriate surgical operations, followed by prolonged rest and a system of exercises to strengthen and restore tone to the supporting muscles, we could no doubt bring about a cure in nearly all cases, but I do not think that this is called for except where the conditions originate in line of duty.

The prophylactic treatment consists of the following: First, careful elimination of recruits with any tendency to flat foot; second, the care of the feet. Give prompt attention to all foot complaints, no matter how trivial. Blisters, bunions, corns, and the results of an ill-fitting shoe cause the man to bear most of his weight on the sound foot, and this strain, if prolonged, will have a tendency to weaken or injure the arch. All men should have shoes of the correct shape and size.

In those men who show a tendency to flat foot, tone up the supporting muscles of the foot by exercises. Rising alternately on the toes and heels about 100 times daily is beneficial. These movements may be increased in number and later done twice daily. Also prescribe exercises which will adduct and invert the foot against a weight of 5 or more pounds. A good and simple apparatus is made by tying one end of a rope around the end of the foot, then passing the rope through a pulley and securing a weight of a proper number of pounds on the other end. Movement of the foot raises and lowers the weight, and this exercises the tibials and flexors of the foot, the supporters of the arch. This exercise should be carried out twice daily, about 100 times at each sitting. Strapping and properly fitting arch supporters are useful in sustaining the arch until the muscles are given tone and strength by the exercises.

To summarize, no recruit should be accepted who has eversion of the foot which can not be corrected by muscular effort, or who has the front of the foot abducted, giving a convex inner border with bulging at the scaphoid tubercle, or whose scaphoid tubercle is more than one-half inch below a line connecting the lower edge of the internal malleolus with the lower tubercle on the head of the first metatarsal bone.

Tight, narrow, poorly fitting shoes should be discarded and properly fitting shoes prescribed. Those who have weak arches should have appropriate exercise ordered.

After debilitating diseases, such as typhoid fever, dysentery, or pernicious malaria the arches of the feet may be weak, and therefore convalescents should not be allowed to stand on their feet too soon or too long, and these weak arches should be treated with rest, support, and later by the prescribed foot exercises. Some of the worst cases of flat foot date back to these diseases.

NOTES ON SUBMARINE CRUISING.

By Passed Asst. Surg. I. FRANKLIN COHN, United States Navy.

As a submarine torpedo boat is of necessity a vessel capable of being rendered water-tight and air-tight for submerged cruising, the effects of the contained air on the health of the occupants are naturally of primary consideration. There are times, too, when it becomes necessary to seal the boat completely while cruising on the surface on account of rough seas, the conditions within the boat then being quite the same as when submerged.

It is not the intention of the writer o indulge in figures pertaining to air analysis, but simply to ment on the effects of submarine cruising on the personnel and to note a few recommendations that would probably tend to improve the existing conditions and increase the habitability of submarines. When cruising on the surface, submarines are propelled by gasoline engines; when submerged, by electric motors. When not under way the gasoline engines are used to charge the batteries and the conditions within the boat are approximately the same as when cruising on the surface. As far as its power to disable men is concerned, the air at the end of a surface run, being more highly charged with gasoline fumes, carbon monoxide, and carbon dioxide, is more dangerous than the air after a submerged run of similar duration, there being no deleterious gases given off by the motors while the submerged boat is running, although the battery gases occasion some discomfort. The rapidly increasing percentage of carbon dioxide and diminishing percentage of oxygen can be remedied more easily by renewing the air within the boat from the tanks of compressed air than can the expulsion of toxic gasoline fumes and the carbonic gases.

Men overcome by gasoline fumes present the following symptoms, which vary according to the duration of exposure and the saturation of the air with the fumes: Unconsciousness, varying from temporary loss of consciousness to profound coma; the breathing is slow and shallow; the pulse feeble and thready, often imperceptible; the skin is pale, moist, and cool. In the more severe cases unconsciousness persists for three or four hours. The regaining of consciousness is often attended with convulsions, restraint being frequently necessary

to prevent bodily harm. The most characteristic symptom is the intense, splitting, frontal headache, the patient pressing his temples with his clenched fists and usually crying bitterly from the intense pain. Many cases develop severe attacks of vomiting, followed by a peculiar nausea and dizziness which lasts some hours. In all mild cases the dominant symptom is headache. The treatment of these cases has consisted of the administration of a rapid diffusible stimulant—strychnine hypodermics have always proved satisfactory—artificial respiration, and, as soon as consciousness and cardiac integrity are regained, either acetanilid or phenacetin is given in moderate doses for the relief of the headache. The patient is not kept below if possible, but is sent on deck to breathe normal air. The administration of oxygen seems a rational procedure and it is intended to use this treatment in the future in addition to the measures mentioned above.

Repeated attacks of gasoline intoxication predispose to cardiac irritability. It is quite common to have men report at the sick bay complaining of palpitation and precordial pain. In these cases the excessive use of tobacco as the causative agent must first be eliminated. Men suffering from what may be aptly called "gasoline palpitation" usually regain normal rhythm after several days' rest and absence from the fumes only to have the condition reappear when they are returned to duty. It has been found necessary to favorably endorse the requests for transfer from the submarine service of several men who developed irritable hearts due to repeated exposure to gasoline fumes.

Coryza, laryngitis, and bronchitis are very common ailments in the submarine personnel, the depressing influences under which the men perform duty and sometimes live for periods of four days, predisposing to this class of diseases. The temperature within the boats is always relatively very low, the facilities for heating being limited, and what little heat is developed is rapidly abstracted by the seas around the thin hull. The air is relatively damp; with but little natural and no artificial ventilation there is a large accumulation of watery vapor in the air within a submarine, and there is considerable "sweating." Tonsillitis is also a common disease, especially when the submarines are separated from the tenders for periods of three or four days. Of necessity the living conditions within a submarine are far from normal and the tendency to tonsillar and rheumatic infection is greatly increased. The men sleep extremely close to each other, and the air is literally alive with respiratory odors and effluvia. Added to these depressing influences are the odors arising from the repeated use of the toilet, which is screened off only with a canvas curtain. The garbage adds its share of odor, as it is often necessary, on account of rough seas, to retain it in the boat in buckets until a hatch can be opened and the buckets emptied overboard.

The rheumatism referred to has been mostly of a muscular type, many men suffering from muscular soreness and cramps after long runs. Long-continued duty in the submarine service undoubtedly predisposes to a condition of anemia as shown by the pallor of men who have served in submarines for periods of two years or more. Associated with this anemia there often arises a neurasthenic condition, the patient complaining of irritability, nervousness, insomnia, loss of appetite, and general depression. One man developed melancholia, which was attributed to the depressing influences of submarine duty.

No serious effects on the eyes have been noted. The boats are very well lighted. An officer is stationed at the periscope when cruising submerged. Prolonged use of the eyes at the periscope would undoubtedly result in severe eyestrain, as this kind of ocular work is very exacting. Occasional cases of conjunctivitis arise from the irritating effect of the battery gases.

Digestive disturbances are not uncommon after long runs, chiefly as a result of prolonged exposure to gasoline fumes. Constipation is common, due to lack of exercise and other influences which tend to promote intestinal sluggishness.

Practically the only injuries which have occurred thus far in the submarine service have been burns of a more or less severe grade. Short circuits have been responsible for several cases of badly burned hands, grafting usually being necessary. The highly inflammable fuel used in submarines has also been the cause of several cases of severe burns on the west coast. Accidents as a rule are of a trivial nature, being chiefly sprains or contused wounds.

The installation of a ventilating system, if practicable, which could be used when cruising on the surface, would vastly increase the habitability of submarines and, by removing gasoline fumes, would remove the chief cause which incapacitates most of the crew. The inclosure of the toilet by a metal compartment with suitable means for discharging the foul air has already been recommended, and it is expected that it will soon be installed in all the boats.

In conclusion, it should be stated that men assigned to submarine duty should be robust and healthy, as the character of the duty is such as to quickly render men of low resistance unfit.

IMPORTANT FEATURES IN THE TECHNIQUE OF CARBON DIOXIDE ESTIMATIONS IN AIR.

By Asst. Surg. E. W. Brown, United States Navy.

Matters are described here which are additional to the instructions for the Pettenkofer method, as issued by the United States Naval Medical School. Nothing original is claimed, only emphasis of certain points of technique which the writer has found helpful in accuracy and in application on board ship.

Collection of the air samples.—To secure a representative sample is obviously one of the most important features. To select a bottle of 3 or 4 liters capacity and attempt to pump in air with a Davidson syringe is indefinite and uncertain; a more reliable method is to exhaust the air in successive large quantities. Mr. G. A. Burrell, in charge of the analytical gas laboratory at the bureau of mines, Pittsburgh, Pa., has informed the writer that 50 contractions with a syringe of the Davidson size, with the valve reversed to exhaust the air, are necessary to obtain a representative sample in a bottle of only 250 cubic centimeters capacity. An excellent plan was that used by Soper [1] in an investigation of the air of the New York subway. A large football or bycicle pump with valve reversed to exhaust air from the collecting flasks of 2,500 cubic centimeters contents was used. This was connected to the collecting flask by about 10 feet of rubber tubing. The free end of the tubing was inserted into the flask as far as the bottom, the operator removed to a distance with his pump, and exhausted air from the flask for about four minutes. This was capable of removing about eight times the volume of air from the 2,500 cubic centimeters flask and insured the collection of a proper sample. When it is recalled that exhaled air contains over 4 per cent CO_2, the importance of preventing contamination from the breath is evident.

Control titrations of the lime water.—These control titrations must be made at the time when the air sample bottles are charged with lime water. The strength of the lime water varies with slight fluctuations in temperature like any other saturated solution. A difference of nearly 1 cubic centimeter in the oxalic acid reading with 25 cubic centimeters of lime water may occur over night.

The titration of the lime water after absorption.—If CO_2 is present in large quantities, the separation of the calcium carbonate after absorption is troublesome in two ways: First, the end point of the titration using phenolphthalein as indicator is indefinite owing to the presence of suspended calcium carbonate; second, an accurate aliquot portion can not be pipetted off. The writer has frequently found air from the brig on board ship to exceed 20 parts in 10,000. In these cases titrations could not be made directly for the reasons just stated. The difficulty was overcome in the following manner: The air sample bottle was provided with an extra rubber stopper, perforated by a glass tube, 2 inches long and ⅛ inch internal diameter, flush with the smaller end of the stopper; 75 cubic centimeters of lime water were always used for the absorption of the CO_2. When this was complete the stopper of the air sample bottle was removed, the extra stopper just described immediately inserted, and the contents transferred to a 50 cubic centimeter bottle, the latter filled to overflowing and

[1] Soper, G. A. The Air and Ventilation of Subways, 1908, pp. 140-141.

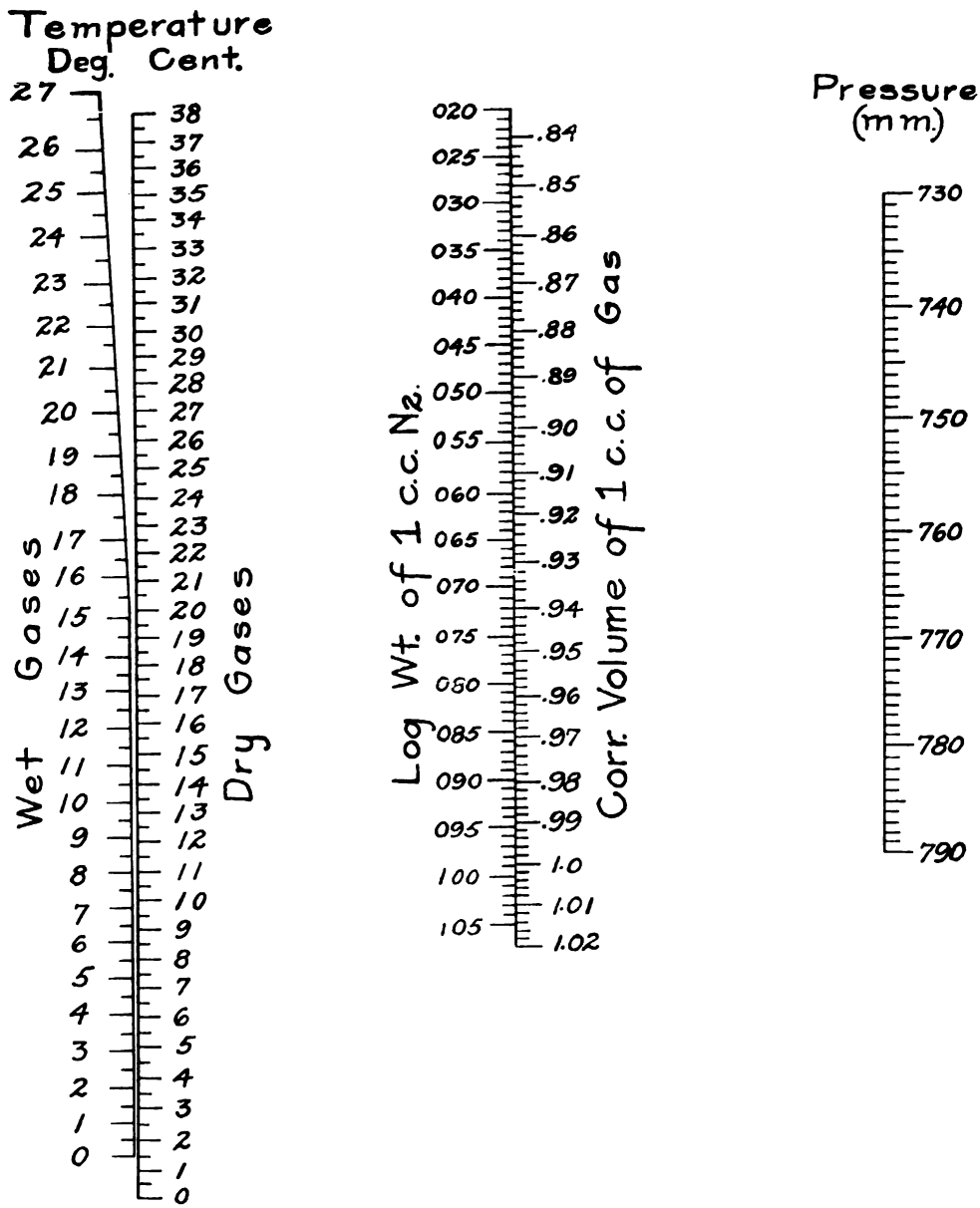


TABLE FOR THE CORRECTION OF GAS VOLUMES.

tightly stoppered. (The 50 cubic centimeter bottle which is carried on the supply table is a proper shape.) It was then allowed to stand for complete settling of the carbonate, and 25 cubic centimeters of the clear supernatant fluid pipetted off for titration. A further advantage of this manipulation is that the samples may stand indefinitely and thus allow a large number to be collected and titrated together.

A chart to correct for pressure and temperature without calculation.[1]—This ingenious device is shown on the opposite page and is used as follows: A straight edge is laid across the diagram so that it cuts the right and left hand scales at the pressure and temperature noted when the air sample was taken. If water displacement is used to collect the air sample, the scale marked "wet gases" is used, otherwise that marked "dry gases." The point at which the central scale is intersected on the right side shows the corrected volume of 1 cubic centimeter of the air at 0° C. and 760 millimeters pressure. The original volume of the air sample is then multiplied by this factor. This gives an accuracy of reading of 0.02 per cent. An immense saving of laborious calculation is thus gained. The left-hand side of the central scale has no connection with the subject of this paper.

Example: Vol. of air sample = 4,250. Temp. = 67° F., or 19.4° C. Bar. = 28.8 in., or 731.5 mm. Right side of central scale intersected at 0.8985. 4,250 × 0.8985 = 3,818.6 corrected air volume.

THE USE OF SALVARSAN ON BOARD THE U. S. S. MICHIGAN.

By Surg. J. J. Snyder and Passed Asst. Surg. A. L. Clifton, United States Navy.

Ever since the announcement to the world of the discovery by Ehrlich of a supposed specific for syphilis and the favorable reports in the medical journals of its effects, it has engaged our attention as a method of treatment that would be well adapted to the needs of the service.

The dull routine of having to appear at the sick bay three times a day for treatment wears on the patient and he frequently becomes discouraged. On the other hand, if he receives the treatment by injections, he has to submit to a somewhat painful procedure every few days, and feels that the treatment, when no symptoms are present, is worse than the disease.

When salvarsan was placed on the market we were besieged by almost all the men on the ship suffering from syphilis asking us to administer the drug and offering to buy it themselves. After going over all the available literature on the subject and witnessing the preparation and administration of the drug by intravenous injection, we improvised an apparatus for this method of treatment which has

[1] Farmer, R. C. The Analyst, vol. 35, p. 308, 1910. The accuracy of this device has been verified in the Bureau of Construction and Repair, Navy Department.

proved very satisfactory. The apparatus consists of the following: A large hypodermoclysis bottle graduated in centimeters, a rubber stopper from an aspirating set with its two-way cock was used with a Davidson's syringe as a pump. Three feet of rubber tubing ⅜ inch in diameter connected the bottom of the bottle with the canula. Two pieces of glass tubing were used as windows to observe the even flow and detect the presence of any air bubbles.

Before giving a synopsis of cases treated we would like to call attention to the difficulties in preparing the solution on board ship. A 15 per cent solution of sodium hydroxide was used to neutralize salvarsan, and after it became alkaline a 1 per cent solution of glacial acetic acid was used to bring it to as nearly neutral reaction as possible and still have a clear solution. In view of the fact that all water on board ship is moderately acid in reaction, when the solution was placed in the hypodermoclysis bottle, which had previously been flushed out with sterile water and salt solution, the salvarsan immediately precipitated, owing to the acidity. This to a great extent was overcome by making the salvarsan solution decidedly alkaline when first prepared and neutralizing it after it had been placed in the hypodermoclysis bottle. We also found that the cotton used to filter the solution had a decidedly acid reaction.

Sixteen cases were selected as being the proper ones for the administration of the drug. A 0.6 gram dose was given in all cases. Of these 16 cases, 11 had open lesions, 2 had a secondary eruption with marked glandular enlargement, and 1 had an intractable sore on penis.

All open lesions disappeared in from 2 to 10 days; the patients increased in weight and all stated that they felt much better than at any time since they had contracted the disease. In one case with a tertiary lesion—a perforation of the nasal septum which was rapidly increasing in size—the disease was arrested and the edge of perforation healed.

Synopsis of cases having open lesions.

Initials.	Rate.	Symptoms.	Result.
J. S. K.	O. S.	Secondary eruption, alopecia, and mucous patches.	Excellent; lesions healed in 1 week.
F. R.	C. Q. M.	Gummatous lesions	Lesions healed.
H. S.	C. P.	Mucous patches	Healed in 4 days.
A. W.	O. S.	Secondary eruption, mucous patches, and marked glandular involvement.	All symptoms disappeared in 2 weeks.
E. J. C.	F. 2c.	Mucous patches	Healed in 4 days.
E. A. H.	Sea.	Tertiary lesion (perforated nasal septum).	Perforation remained stationary in size.
F. W. J.	F. 2c.	Secondary eruption, mucous patches	All lesions disappeared in 1 week.
W. W. H.	1st Mus.	Ulcerated pharynx	Healed in 7 days.
P. E. H.	F. 2c.	Mucous patches	Healed in 4 days.
J. E. C.	F. 2c.	Mucous patches; condylomata	Healed in 10 days.
W. A. H.	Mus. 2c.	Chancre and marked glandular enlargement.	Sore healed in 6 days after resisting local treatment for 3 weeks.

The first dose of salvarsan to be used on the U. S. S. *Michigan* was administered on February 7, 1911.

In all cases a complete physical examination of the patient was made before administration of "606," and after the administration patient was kept in bed 2 days and started on mercury immediately.

From the above synopsis it is believed that salvarsan would be a useful drug to use on board ship, as the open lesions can be controlled and the chance of infecting others is greatly reduced. Secondly, the total number of sick days from this disease will certainly be reduced if the disease can be controlled at once. Thirdly, the drug is easily administered and little or no pain is experienced with the intravenous method.

NOTES ON VACCINATION.

By Passed Asst. Surg. A. B. Clifford, United States Navy.

The officers and men of the U. S. S. *Albany* were vaccinated in August, 1910, with no positive results among the officers and only about 4 per cent among the men. In April, 1911, prior to the departure of the fleet for China and Japan, a supply of fresh vaccine was obtained from the bureau of science, Manila. This vaccine had been tubed and put in cold storage the day before we received it. When brought on board it was immediately placed on ice and kept there until used.

It is necessary to keep vaccine cold, as it loses its potency very quickly at ordinary temperatures.

This fact probably accounts in part for the indifferent results often obtained at home, when vaccine which has been kept for weeks, perhaps, at ordinary temperatures is used.

Frequent vaccination with such vaccine, with uniformly negative results, undoubtedly engenders a false sense of security. Furthermore, a considerable proportion of the personnel remains unprotected.

The results obtained with this fresh vaccine emphasize very forcibly the truth of these propositions.

Of the total number (361) vaccinated 68.7 per cent were positive. Of this total 14 had had smallpox and 307 had evidence of previous successful vaccination, viz, one or more good scars. Sixty-seven and six-tenths per cent of these were positive. The remaining 40 were unprotected. They had been vaccinated frequently but never successfully. Every one of these was markedly positive, with more or less severe constitutional symptoms. In other words, prior to April, 1911, over 11 per cent of the ship's personnel were unprotected in spite of repeated vaccination.

Of the 16 officers 15 were positive. All of them had good marks of from 10 to 23 years standing, numerous vaccinations in the intervening years having been negative.

Two methods of scarification were used: (*a*) scalpel, (*b*) several layers of sterile gauze over the finger. Equal numbers were vacci-

nated by each method. Judging from the results there is no choice between the two methods, consequently it is largely a matter of individual preference. The gauze method has, however, advantages which are worthy of note:

1. It gives a good amount of serum without blood.
2. The subject has no dread of the operation.
3. It obviates the necessity of sterilizing between vaccinations.

THE PREPARATION OF PATIENTS FOR OPERATION AT THE UNITED STATES NAVAL HOSPITAL, NORFOLK, VA.

By Surg. W. M. Gabron, United States Navy.

During the past two years in the surgical work at this hospital the iodine method of skin sterilization has been used. The results have been satisfactory, time is saved, the technique is not elaborate and the patient is not worried by the details of preparation. It seems that the days of soap poultices, wet dressings, and repeated scrubbings are past. Moreover, the patient does not lie on wet sheets nor is he covered with wet towels in the early stages of the operation.

The following is the method of preparation at this hospital:

Full dose of castor oil the day before operation.

Nothing by mouth for 12 hours preceding operation.

The field of operation is kept dry for at least 24 hours preceding operation.

A dry alcohol shave is given 12 hours before going to the operating table. A dry sterile gauze dressing is applied after the shave.

The patient is anæsthetized, placed on the operating table, and the field of operation given one heavy coating of tincture of iodine, U. S. P. Wait five minutes before placing the sheets. After the wound is closed remove the excess of iodine by the application of alcohol. This prevents skin irritation and blistering. The wound is then covered with iodine gauze (1 to 500) or formalin gauze (1 to 1,000).

If the skin is covered with perspiration, absolute alcohol is used to remove the moisture before painting with iodine.

The following are the operations since January 1, 1911, in which the above method of preparation has been used:

	Number.		Number.
Hernia	37	Hydrocele	2
Appendectomy	25	Adenectomy	2
Amputations	9	Excision of cysts	2
Varicocele	8	Parotidectomy	1
Varix	6	Exploratory laparotomy	1
Plastic operations	5	Excision of coccyx	1
Craniotomy	5		
Arthrotomy (knee)	4	Total	110
Gastroenterostomy	2		

With three exceptions the wounds healed by primary union. In two of these cases a small skin abscess occurred, and in the third, in which a gangrenous appendix was removed, infection of the subcutaneous tissues occurred, necessitating drainage for one week.

During the year 1910 there were 118 major and 160 minor operations performed in this hospital. In each case the above-described method of preparation was used with uniformly excellent results.

It is the ideal method for emergency surgery. In these cases it is our custom to dry shave the operative field, apply the iodine tincture, wait five minutes, and then the patient is ready for operation.

U. S. NAVAL MEDICAL SCHOOL LABORATORIES.

SPECIMENS ADDED TO THE HELMINTHOLOGICAL COLLECTION, UNITED STATES NAVAL MEDICAL SCHOOL, JUNE–AUGUST, 1911.

Accession No.	Name.	Host.	Collected by or received from—
19771	Spurious parasites, pollen cells	*Homo* (Japanese)	C. J. Powers, naval hospital, New York.
19772	*Trichinella spiralis* (embryos)	White rat	L. Avery, Washington, D. C.
19773	do	do	Do.
19774	*Strongyloides stercoralis* (embryos)	*Homo*	F. H. Stibbens, naval training station, San Francisco.
19775	Hookworms	do	G. F. Cottle, Tutuila, Samoa.
19776	*Oxyuris vermicularis*	do	Do.
19777	*Ascaris*	do	Do.
19778	Fly larva		W. H. Short, Key West.
19779	*Ascaris*	*Homo*	P. R. Stalnaker, Culebra.
19780	do	do	Do.
19781	Arthropods		Do.
19782	*Echinococcus* cyst	*Homo*	G. F. Cottle, Tutuila, Samoa.
19783	*Tænia saginata* (head)	do	Medical officer, U. S. S. Mississippi.
19784	*Tænia saginata* (ova)	do	Riggs and Woodland, U. S. S. Iowa.
19785	*Tænia saginata* (head and strobila)	do	Do.
19786	*Schistosoma hæmatobium* (adult)	do	Capt. J. F. Siler, Medical Corps, U. S. Army.

ADDITIONS TO THE PATHOLOGICAL COLLECTION, UNITED STATES NAVAL MEDICAL SCHOOL, JUNE–AUGUST, 1911.

Accession No.	Tissue.	Diagnosis.	Collected by or received from—
561	Male breast	Adenofibroma, nonmalignant.	R. Spear, naval hospital, Washington, D. C.
562	Tumor from lower lip	Malignant epithelioma	U. R. Webb, naval hospital, Mare Island, Cal.
563	Blood smears	Black-water fever	Stalnaker and Shepard, Culebra, P. R.
564	Testicle	Tuberculosis	M. A. Stuart, navy yard, Charleston, S. C.
565	do	do	E. W. Phillips, U. S. S. Paducah.
566	Superficial tissue, gluteal region.	Not tubercular; necrosis with leucocyte and round-cell infiltration.	C. M. Oman, naval hospital, New York, N. Y.
567	Appendix	Appendicitis	Do.
568	Skin	Round-cell infiltration and epithelial proliferation.	Medical officer, naval training station, San Francisco.
569	Hydrocele sac		N. J. Blackwood, naval hospital, New York.
570	Tumor of lower lip	Squamous papilloma	A. J. Geiger, naval hospital Mare Island, Cal.
571	Skin from right ear	Fibroma	Medical officer in command, naval hospital, Philadelphia, Pa.
572	Blood smear	Malaria	H. L. Kelly, U. S. S. Yorktown.
573 to 578	Appendices	Appendicitis	C. M. Oman, naval hospital, New York, N. Y.
579	Testicle		Do.
580	Tumor of neck	Nonmalignant	A. J. Geiger, naval hospital, Mare Island, Cal.

Additions to the pathological collection, United States Naval Medical School, June–August, 1911—Continued.

Accession No.	Tissue.	Diagnosis.	Collected by or received from—
582	Kidney	Interstitial nephritis	C. M. Oman, naval hospital, New York, N. Y.
583	Testicle	Tuberculosis	Do.
584	Uterine	Abortion	G. F. Cottle, Tutuila, Samoa.
585	Echinococcus cyst		Do.
586	Appendix	Appendicitis	Do.
587	Uterine	Abortion	Do.
588	Axillary nodes	Tuberculosis	Do.
589	Mammary gland	Cyst	Do.
590	Toe	Yaws	Do.
591	Cervical glands	Tuberculosis	Do.
592, 593	Appendices	Appendicitis	C. M. Oman, naval hospital, New York, N. Y.
594	Kidney, spleen, and liver	Leprosy	H. E. Odell, Guam, M. I.
595	Superficial tissue of buttock	No tubercular ulceration	C. M. Oman, naval hospital, New York, N. Y.
596	Cyst and appendix	Fatty and calcareous deposit	N. J. Blackwood, naval hospital, New York, N. Y.
597	Toenail	Trichophytosis	Riggs and Woodland, U. S. S Iowa.

AN APPARATUS FOR HOISTING PATIENTS ABOARD THE U. S. HOSPITAL SHIP SOLACE.

Patient in stretcher which is hooked on and ready for hoisting.

AN APPARATUS FOR HOISTING PATIENTS ABOARD THE U. S. HOSPITAL SHIP SOLACE.

Patient in stretcher hoisted halfway.

SUGGESTED DEVICES.

AN APPARATUS FOR HOISTING PATIENTS ABOARD THE HOSPITAL SHIP SOLACE.

By Surg. E. M. BLACKWELL, United States Navy.

The U. S. S. *Solace* was placed in service as a hospital ship in November, 1909. As hospital ships were comparatively a new departure, many problems and details remained to be worked out. Not the least of these was a satisfactory apparatus and method for hoisting the sick aboard from boats alongside in a rough seaway. In port and in smooth water, patients could be easily gotten aboard by carrying them up the gangways in stretchers or taking them in through large cargo ports in the sides of the ship.

For taking patients aboard in rough seas, there was a boom which could be rigged at either gangway ladder and swung out, the patient hoisted, swung in to the side of the ship, and taken on board. It required a good deal of tackle and six men to operate it properly, and swinging it in was attended with considerable danger to the patient when the ship was in a rough seaway. As the booms were located at the gangway ladders, there was danger of boats being caught under the ladders when the ship was rolling.

While the Atlantic Fleet was at target practice on the southern drill grounds in the spring of 1910, patients had to be transferred daily from the ships of the fleet to the *Solace* for treatment. As the sea at times was quite rough, this was often accomplished with danger and difficulty. The inadequacy of the facilities for getting patients aboard was soon recognized, and the commanding officer requested me to devise some convenient and safe apparatus for remedying this defect. It was to be located in the after part of the ship, where the force of the waves was not so great as farther forward.

As the gangways between the deck house and the rail on the upper deck of the *Solace* were rather narrow, it was impracticable to install the hoisting apparatus in them. The only place that was practicable for its installation was on the after part of the upper deck in an athwartship passageway between the medical officers' quarters and the sick officers' quarters. This passage is 8 feet wide and has a hatch 4 by 12 feet in the after part leading to the deck below. It is well aft, and the force of the waves is not so great and the sea not so rough as farther forward, and, as there is an apparatus on either side, patients can always be hoisted on the lee side of the ship.

The principle of the hoisting apparatus is as follows: An arm extends out over the ship's side for 8 feet, with a trolley with block and tackle attached, which trolley travels back and forth on the arm. The arm consists of a 6-inch I beam secured to three crossbeams by grips which permit it to be run out and in as necessary. On the outer end of this beam is a pulley over which is run a guy line attached to the trolley, by means of which the trolley is run out to the end of the beam and secured. The beam can be run out 4 feet or 8 feet and secured to the crossbeams by pins. The trolley has four traveling wheels, two on either side, which run along the lower flanges of the beam, and two sheaves below the beam, over which the tackle runs to the block. Below these sheaves is a crossbolt which engages and secures two hooks on the block when it is hauled up. There is a hook on the lower end of the block, to which the stretcher is secured by an eight-tailed bridle which has large hooks on the ends which easily snap on and off the stretcher.

The most delicate and difficult mechanism about the apparatus is the device for automatically hooking on and securing the block to the trolley when the block is hauled up, thereby making the stretcher with the patient perfectly secure while the trolley is being run in. There are two inverted hooks, one on each side of the upper part of the block. When the block is hauled up, these hooks impinge against a crossbolt in the lower part of the trolley. They act as inclined planes, and as the block is pulled higher they are tilted out until their points are clear of the bolt, when they resume their vertical position. The hoisting line, or purchase, is then eased off and the hooks catch securely on the crossbolt, and the trolley is run in by hauling on the purchase.

Four men are required for operating the apparatus; one to handle the guide line which controls the stretcher and keeps it from swinging or turning; one to handle the loose end of the purchase and also the guy line which runs the trolley out and secures it; two to hoist the patient by hauling on the purchase.

In operating this apparatus, the parts to be taken into consideration are the beam, the hoisting line or purchase, the guy line which runs the trolley out and secures it, the attached stretcher, and the guide line attached to the stretcher.

The steps to be taken in operating it are as follows:

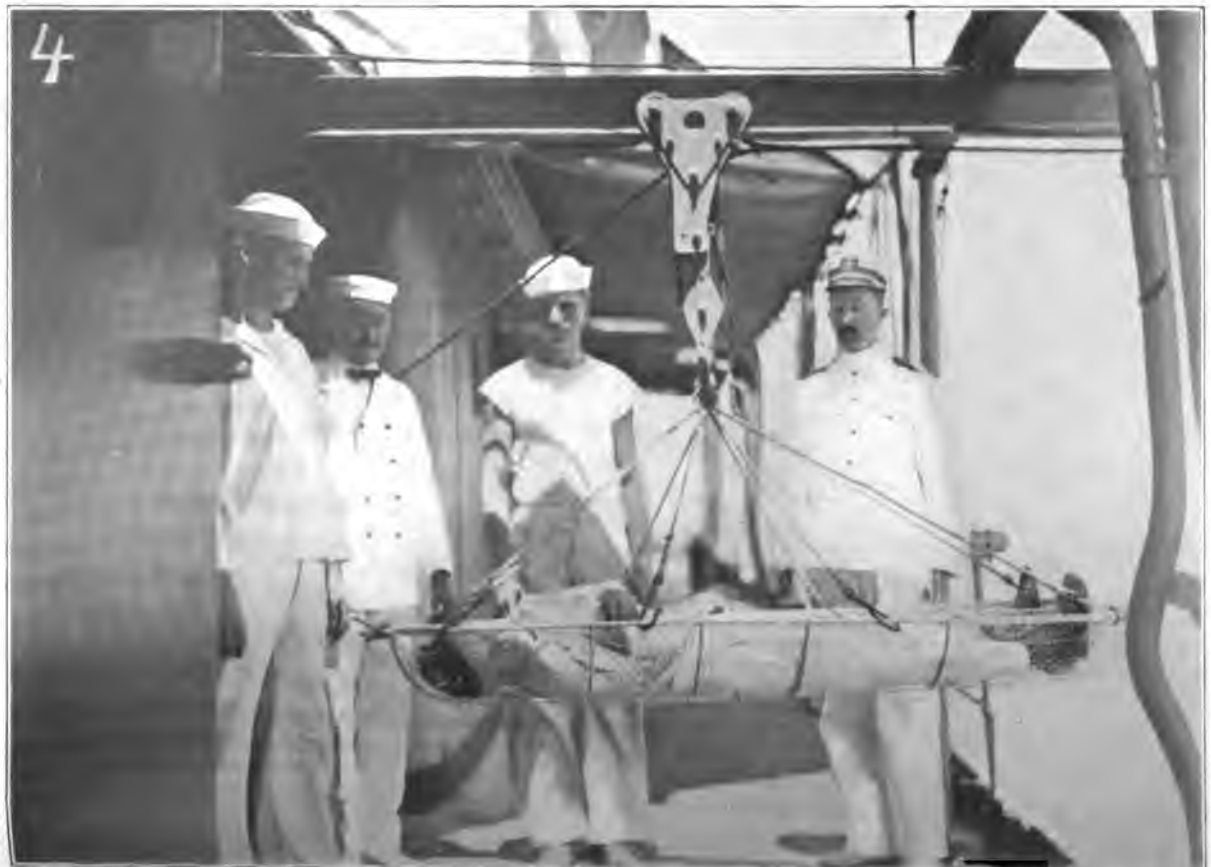
First. Remove the portable rail from the side of the ship under the crane to allow stretcher to be run in on deck.

Second. Rig out tackle, run out beam, and secure. The purchase and the guy line are loosened and uncoiled. The beam is run out and secured in place by pins.

Third. Slack away on purchase and haul on guy rope. These are done simultaneously. Hauling on the guy lines hauls the trolley

AN APPARATUS FOR HOISTING PATIENTS ABOARD THE U. S. HOSPITAL SHIP SOLACE.

Patient in stretcher hoisted all the way and secured.



AN APPARATUS FOR HOISTING PATIENTS ABOARD THE U. S. HOSPITAL

out to the end of the beam and the guy line is then belayed, which secures the trolley.

Fourth. Lower away on purchase. This lets the block down to the boat below where the stretcher containing the patient is hooked on.

Fifth. Hoist away on purchase. The purchase is hauled in until the points of the hooks on the block pass the crossbolt, when it is eased away and the hooks engage the crossbolt.

Sixth. Slack away on the guy rope and haul on purchase; belay guy rope. Slacking away on the guy rope allows the trolley to be hauled in on deck by the purchase; the guy rope is then belayed.

Seventh. Lower stretcher to deck. This is done by coming up on the purchase and pulling out on the hooks by a short line attached to disengage them and lowering away on the purchase.

Eighth. Run in and secure beam, trolley, and tackle.

The accompanying photographs of the apparatus in action demonstrate its utility. While the apparatus is not all that could be desired, it is simple, safe, and satisfactory. It is useful also in getting stores and other things aboard and in lowering heavy articles over the side.

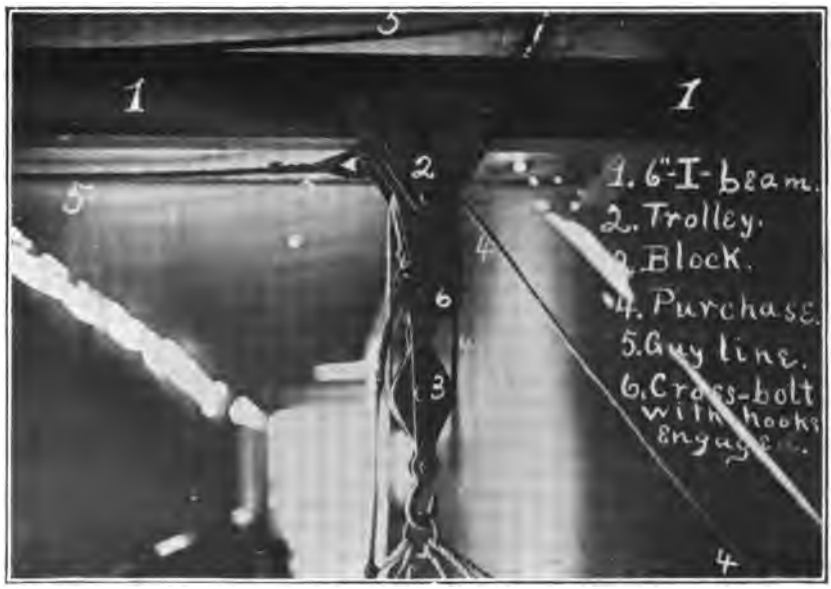
AN INEXPENSIVE AND SATISFACTORY ETHYL CHLORIDE INHALER FOR GENERAL ANÆSTHESIA.

By Hosp. Steward J. H. Barton, United States Navy.

Take an Allis ether inhaler and draw a No. 8 rubber operating glove over the top in such a manner as to leave the thumb on the operator's right, and far enough down over the inhaler to insure its staying in place—about an inch and a half. Next cut a small opening in the tip of the thumb, insert the tip of the ethyl chloride inhaler, and make the glove fast by taking a few turns around the container tip, over the glove, with coarse twisted silk. The most convenient container for the ethyl chloride is "Gebaus" with the glass tip; with this form the operator can easily control the flow of the anæsthetic. This contrivance has been found to work more satisfactorily than other patented inhalers or the open method and takes but a very small amount of the anæsthetic.

The glove collapses and fills as the subject inhales and exhales, and the small amount of air admitted around the bottom of the inhaler seems to be enough for all requirements. Ninety seconds of application insures a minute and a half of complete anæsthesia, and a minute and a half is ample for three minutes of anæsthesia, insuring time (after a few trials) for getting the subject under the influence of ether without regaining consciousness or for performing minor operations.

This method has been used with success in more than 100 cases in a naval hospital.



TWO VIEWS OF THE APPARATUS FOR HOISTING PATIENTS ABOARD FROM BOATS ALONGSIDE THE U. S. HOSPITAL SHIP SOLACE

OLD "IRREDUCIBLE" DISLOCATION OF THE HEAD OF HUMERUS BEFORE OPERATION.

Showing head of humerus in axilla, and fragment of detached bone.

CLINICAL NOTES.

OLD "IRREDUCIBLE" DISLOCATION OF HEAD OF HUMERUS.

By Surg. H. C. Curl, United States Navy.

The patient, a Malay sailor on a British collier, was thrown violently against the rail during a storm. He struck over the upper part of humerus and found at once that he could not use the arm.

Because of the very heavy weather, nothing could be done for him for some hours, and when examined by the captain the swelling was so great that he could not tell what the injury was. He was referred to us one month later. The case was diagnosed and an unsuccessful attempt at reduction was made while patient was under ether. Operation was then recommended and accepted, as holding out some chance of improving an otherwise useless and painful arm.

Operation under ether; time, 1 hour and 30 minutes.

An incision 4 inches long was made in the "deltoid groove" down to and entirely through the attachment of the pectoralis major to the humerus; the deltoid was then lifted from over the glenoid fossa by blunt dissection and the fossa cleaned out after incising the remains of the capsule, which was still attached to the rim of the fossa.

It was then found that the capsular ligament had been entirely torn apart, one portion remaining attached to the head of the humerus. Everything between the fossa and head of the bone was a "welded" mass of scar tissue and had to be removed by careful dissection. This was done external to the biceps. Next the inner border of the biceps was exposed by blunt separation and the head of the humerus entirely cleared in axilla, freedom from adhesions to the vessels and plexus being demonstrated. The musculo-cutaneous nerve was retracted downward.

A bony fragment torn from the lesser tuberosity was removed. With great difficulty, by traction and leverage, the dislocation was reduced. There seemed to be no tendency to recurrence, but the arm was kept close to the side and dressed in that position. Pectoralis major was then sutured, and the deep muscles united by buried sutures. Drainage was used for four days. The skin sutures were taken out on the sixth day and passive motion begun.

At present the patient can use the arm to feed himself and a useful member is assured, though, of course, with some limitation of motion.

The case is of interest because of the entire separation of the torn capsule, the scar-tissue "welding," and the extensive dissection necessary. (See illustrations.)

A CASE OF BRAIN TUMOR.

By Surg. R. E. Hoyt, United States Navy.

This case is one of more than usual interest and illustrates well the difficulties often encountered in attempting accurately to localize intracranial lesions with focal symptoms when combined with marked signs of intracranial pressure. At no time was there any difference of opinion among those who examined the patient as to the approximate location of the growth, as all signs and symptoms pointed to involvement of the right half of the brain. At autopsy, however, a large tumor of the left side was found.

The patient, J. R., fireman, first class, was a native of Austria; age, 29 years; single; of good family history; regular in habits, and serving his second enlistment in the Navy. Health record during his naval service had been excellent up to his present illness.

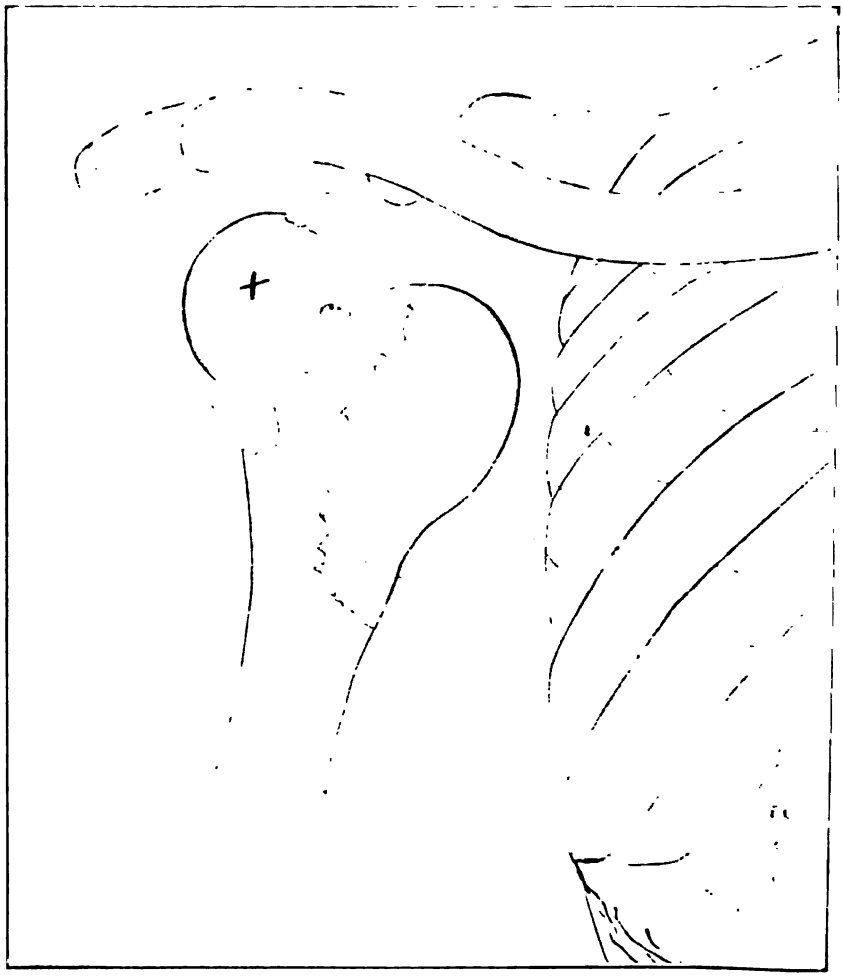
On October 3, 1909, he was transferred from one of the ships on the Asiatic Station to the United States naval hospital at Canacao with the diagnosis of "neurasthenia." He was under treatment there for about two months and was then transferred to an Army transport for passage to the United States. It was stated in the records accompanying him that, while under observation in that hospital, he had complained of frequent pains in the head and, at times, paræsthesia of the left side of the face. Examination showed irregularity of the pupils, contraction of the visual fields, reduction in acuity of vision to 8/20 for each eye, exaggeration of the superficial and deep reflexes, and the presence of a false ankle clonus. It was also stated that the ophthalmoscopic examination showed indistinct and striated disks with a few scattered white spots.

According to the statement of a hospital apprentice who returned on the transport with him, the patient became practically blind a few days after sailing, and it became necessary to confine him in the sick bay in order to avoid injury. During the trip across the Pacific the patient suffered two attacks of coma lasting a few days in each case, and, during the last attack, it was thought that he would not recover.

Upon his arrival at the Mare Island Hospital, January 12, 1910, examination showed a fairly well-nourished man. On walking, a spastic condition of the left leg was noticed, and the left arm was held in a flexed and slightly rigid position. There was practically total blindness of both eyes, the patient being able to distinguish only between light and darkness. Pupils were regular, slightly dilated, and reacted sluggishly to light. There was bulging of both eyeballs. Hearing in both ears appeared to be normal. No motor or sensory disturbances could be detected over his head or neck. Tongue was protruded in a straight line. Speech was slow and slightly thick, but this was accounted for by the abnormal mental condition to be

OLD "IRREDUCIBLE" DISLOCATION OF THE HEAD OF HUMERUS AFTER OPERATION.

X-ray photograph showing head of bone replaced. (See page 471.)



OLD "IRREDUCIBLE" DISLOCATION OF THE HEAD OF HUMERUS. A ROUGH DIAGRAM OF TORN CAPSULE.

The glenoid, marked X, is covered by adherent torn capsule. (See page 471.)

scribed. There was a spastic weakness of the left side—arm and g—with increase in all reflexes. Knee jerk markedly exaggerated, ıe ankle clonus, and Babinski's sign were present. Sensation over t side appeared to be somewhat dull, but nothing very definite uld be ascertained owing to feeble mental condition. Stereognostic nse appeared normal. Reflexes and sensation on the right side were actically normal. The patient's mental condition was that of a eble-minded person. There was slowness of thought and speech; ıe patient speaking only in reply to questions. While answering, e would often laugh in a foolish manner or cry and talk in a whining oice. If left undisturbed, he would remain in the same position for ›ng periods of time. If told to walk, he would do so but, unless uided, would walk into walls or articles of furniture owing to defective ision.

His chief complaints were blindness and, at times, headaches that vere localized over right frontal region and did not appear to be very evere. There was no emesis, nor could any symptoms of vertigo e elicited. Ophthalmoscopic examination showed marked optic neuritis of both eyes; examination of the blood and urine showed nothing abnormal; pulse and temperature remained practically normal throughout the illness. Examination of chest and abdomen showed nothing abnormal. There were no signs of past or present venereal disease.

The marked mental deterioration, sluggishness of thought, apathy, and, at intervals, a stuporous condition, together with the localization of the headache over the right frontal region, strongly suggested involvement of the frontal portion of the cerebrum. The early and marked involvement of both optic nerves, which suggested direct pressure, seemed, when taken in conjunction with the above symptoms, to indicate either a basal or deeply seated subcortical growth. The spastic condition of the entire left side with increased reflexes and ankle clonus indicated either involvement of, or pressure upon, the motor fibers from the right cortical area. The diagnosis of a basal or deeply subcortical growth involving the right frontal lobe and exerting pressure on the right motor tract was, therefore, made. In spite of the lack of any evidence of syphilitic infection, mercury and the iodides were given in large doses and continued for two months without any apparent benefit.

During the first two months in the hospital the patient's condition remained much the same as on admission. Most of his time was spent sitting in a chair, and with the assistance of a nurse he would walk to and from his bed. Headache did not appear to be severe. About the middle of February he became bedridden and had attacks of stupor lasting several days, alternating with longer periods during which he appeared brighter. During these stuporous attacks it was

very difficult to administer food, but during the intervals his appetite was voracious. The slowness of thought and speech became more marked. The spastic weakness of left side developed into a hemiplegia, the face and tongue being included. Reflexes remained exaggerated.

It was evident that the growth or intracranial pressure was increasing in spite of treatment, and on April 9 a subtemporal decompression operation was performed on the right side under light ether anæsthesia. On opening the dura the brain tissue bulged markedly into the opening, and the cortex had the appearance of being under great pressure. Exploration with the finger and palpation of the cortex in the vicinity of the opening failed to detect the tumor. The pressure being partially relieved, the temporal muscle was sutured over the brain tissue and the wound closed in the usual manner. Patient stood the operation very well, and after the effects of the ether had worn off appeared mentally brighter than before the operation. The paralytic condition remained unchanged.

This slight improvement lasted only a few hours, however, and gradually the former stuporous condition developed and deepened to coma on the second day. Marked dyspnœa and œdema of the lungs preceded death, which occurred at midnight, April 12, 1910.

At autopsy an encapsulated endothelioma the size of an orange was found situated in the frontal region and extending from the base to within an inch of the cortex. The tumor was situated entirely on the left side, and by its growth had caused displacement and pressure atrophy of the brain tissue surrounding it. Except for the effects of generally increased intracranial pressure, the entire right lobe and remaining portions of the brain appeared normal.

This unexpected location made it difficult to understand the presence of the hemiplegia on the same side as the lesion with practically no motor or sensory symptoms on the opposite side.

From a surgical standpoint the case was of special interest, for there is scarcely a doubt, in case a radical operation were decided upon, that the right side of the skull would have been opened, with resulting failure to locate the tumor.

A CASE OF BRAIN ABSCESS.

By Passed Asst. Surg. J. R. Phelps and Asst. Surg. G. F. Clark, United States Navy.

C. A. M. Admitted April 18, 1911, with diagnosis of cholelithiasis.

He had been perfectly well until January 11, 1911, when he complained of general bodily pain, headache, anorexia, and gastric disturbance. About April 1 he complained of stabbing pain through the body at level of the lower border of the ribs on the right side, beginning behind and radiating to the region of the gall bladder, to

OLD "IRREDUCIBLE" DISLOCATION OF THE HEAD OF HUMERUS.

Result showing operation scar in deltoid groove. (See page 471.)

right shoulder, and down the right arm. These attacks have asionally been present ever since.

'n admission he was moderately emaciated. Temperature was 2° F., pulse 96, and respirations 20. Examination of the chest wed a few crepitant râles below the right clavicle and extensive ural friction sounds in the lower part of the right axilla. He had pain or tenderness in the region of the gall bladder. There were signs of cardiac or circulatory changes. Superficial and deep lexes were normal. His blood showed 60 per cent of hæmoglobin, 00,000 red cells, 10,000 white cells, and a normal differential int. An analysis of the gastric contents after a test breakfast owed a total acidity of 26, no free hydrochloric acid, and no lactic id or occult blood. There was nothing abnormal microscopically. ces showed no ova, parasites, tubercle bacilli, free fats, or muscle ers. The urine was normal. Moderate night sweats occurred.

The following evening his temperature rose to 100.2° F., and the xt day to 101.5° F. He had two attacks of hæmoptysis, in which lost about 30 cubic centimeters of bright red frothy blood. Durg the next two days cough was annoying, and there was a good eal of pain in the lower right chest. Repeated examinations of the utum, which had become rusty, failed to show any tubercle bacilli, ut contained numerous pneumococci. A Moro test gave a few mall papules. A radiogram of the chest suggested contraction of he right side, with marked thickening of the pleura and retraction f the diaphragm. His blood pressure was 120. He passed 1,500 ubic centimeters of urine in 24 hours, containing 4 per cent of urea, nd no albumin, sugar, or casts. Cammidge reaction negative.

There was no evidence of disease outside of the chest, and the diagnosis was changed to tuberculosis, April 22, 1911, on account of the loss of weight, night sweats, cough, slight fever, pleurisy, and crepitant râles at the right apex.

For three days his temperature ranged from 100° F. in the morning to 102° F. or 103° F. in the evening, but he felt well and did not appear to be acutely ill. From then his temperature gradually subsided until it was normal, about three weeks after admission. On May 10 he was 20 pounds under weight.

He began to have right frontal headache May 14, 1911. His eyes were examined by Dr. E. J. Grow, United States Navy, and no changes were found in the retinæ or disks. He had a strabismus which had existed for many years. His temperature was normal, and he showed no mental symptoms. Four days later left hemiparesis with impaired sensation developed. At first there was only a scarcely noticeable weakness. Blood pressure was 130; pulse, 50 to 60. He stated then, for the first time, that he had had attacks of numbness on the right side upon getting up in the morning on

several occasions during the preceding four months. He had no nausea or vomiting, and said he had no headache. Reflexes were about normal. The weakness on the left side gradually increased until on May 19 his speech was impaired, the tongue was protruded to the left, he was fogged mentally, and urine and feces were passed involuntarily. His leucocyte count was 9,600. Twenty-four hours later he began to lapse into coma, which deepened rapidly for several hours, when he died. Complete hemiplegia was not present at the time of his death.

At autopsy the right lung was found adherent posteriorly and to the diaphragm. In the lung itself there were several small nodules about the size of almonds. No marked gross changes were found in the other organs except the brain, in which was found a large abscess. The abscess cavity occupied a space of about 20 cubic centimeters in the right cerebral hemisphere. Dissection of the hardened brain showed the cavity to be irregular in shape, completely surrounding the anterior horn of the lateral ventricle, and extending from the orbito-frontal to just above the mid-frontal gyrus. From side to side it came to within one-quarter inch of the external surface and to within one-eighth inch of the internal surface, encroaching upon the corpus callosum at the greatest diameter of the abscess. Roughly, the dimensions were 2½ inches by 1½ inches. Upon removing the brain the abscess was so near the surface in the orbito-frontal gyrus that it ruptured for a distance of about 1¼ inches, just forward of the sylvian fissure, and a quantity of thick, bloody, purulent material escaped. The abscess in its growth developed in the white matter of the frontal lobe, and it was this tissue which chiefly suffered destruction. The internal capsule was not encroached upon except for a few of the extreme anterior radiations (thalamo-frontal tract).

Microscopic examination of sections from the right lung showed atelectasis, congestion, and evidence of recent infection. The kidneys showed cloudy swelling. Sections from the brain showed the same destruction that was visible microscopically. Cultures made at autopsy gave no growth.

This case probably began with extensive diaphragmatic pleurisy on the right side, which gave rise to confusing symptoms leading to a diagnosis of gall stones. Later there was a lighting up of the process in the lung, resulting in an atypical pneumonia, simulating tuberculosis clinically, and this probably accounts for the source of the infection producing the brain abscess. The involvement of a "silent" area of the brain allowed the abscess to develop for some time without presenting sufficient evidence for diagnosis.

REPORT OF TWO CASES OF CEREBROSPINAL FEVER.

By Surg. R. A. BACHMANN, United States Navy.

[From the United States Naval Hospital, Newport, R. I.]

The two following cases of epidemic cerebrospinal meningitis are interesting on account of the promptness and certainty with which Flexner's serum effected favorable terminations.

Case 1.—Admitted December 11, 1910.

Symptoms: Severe headache, mostly occipital; pains in chest near region of heart.

Signs: Kernig's present; knee reflex lost; pupils normal; some retraction of head; pulse, 46, irregular; temperature, 103° F.; respiration, 18.

Spinal fluid: Cloudy; negative for meningococci and tubercle bacilli; numerous leucocytes; 70 cubic centimeters withdrawn; blood, 11,000 leucocytes.

On account of an accident to the syringe no serum could be injected and a delay of four days occurred. The disease progressed rapidly and unfavorably as follows:

December 12, 1910—Symptoms: Headache severe, vomiting, muscular tenderness about spine.

Signs: Temperature, 101° F.; pulse, 48; respiration, 18.

December 13—Symptoms: Same as previous day.

Signs: Temperature, 103–99.5° F.; herpes appeared on lips; tâche cérébrale, spinal rigidity, and photophobia present.

December 14—Symptoms: All increased in severity.

Signs: Temperature, 103–100.5° F.; pulse, 60.

December 15—Lumbar puncture; 20 cubic centimeters very cloudy fluid withdrawn; diplococcus intracellularis meningitidis found; 30 cubic centimeters Flexner's serum injected; note the immediate improvement.

December 16—Symptoms: Headache gone; seems much improved in every way.

Signs: Temperature normal during the day; rose to 100° F. at night.

December 17—Thirty cubic centimeters spinal fluid withdrawn; not so cloudy as the last specimen; same amount of serum injected.

December 18—Symptoms: None, excepting slight stiffness of back of neck.

Signs: Temperature, pulse, and respiration continuously normal.

December 21—Diplopia present and slight strabismus noticed; left external rectus involved.

February 10, 1911—Patient is steadily improving; able to walk; appetite good; bowels regular.

February 15—Discharged to duty in good condition; no ocular symptoms; cure complete; has remained so to date, March 8.

Case 2.—Admitted January 31, 1911.

Symptoms: Attack sudden; was apparently well at 9 a. m.; at 3.30 p. m. he was unconscious.

Signs: Convulsions; loss of consciousness; Kernig's sign present; reflexes exaggerated; spinal tenderness; temperature, 104°–101° F.; pulse, 100; respiration, 30.

February 1—Symptoms: Still delirious; restraint necessary to keep the patient in bed.

Signs: Temperature, 100°–103° F.; pulse, 70–100; respiration, 26.

Spinal fluid: 60 cubic centimeters withdrawn, turbid, contained leucocytes and a few meningococci; 30 cubic centimeters Flexner's serum injected; note the immediate improvement.

February 2—Symptoms: Patient unconscious; complains of occipital headache; pains in back and limbs.

Signs: Temperature, 100°–102° F.; Pulse, 62–74; respiration, 23; extensive herpetic eruption appeared about mouth and on hard palate; no rash.

February 3—Symptoms: Chiefly headache, which patient states is intense, preventing sleep; hypnotics necessary.

Signs: Temperature 100°–103° F.; pulse, 74–82; respiration, 22.

Spinal fluid: 40 cubic centimeters removed; still cloudy; 30 cubic centimeters serum injected.

February 4—Symptoms: Headache milder; stiffness in muscles of back.

Signs: Temperature normal.

February 5—No change.

February 6—Symptoms: Return of headache.

Signs: Temperature normal.

Spinal fluid clear; 24 cubic centimeters withdrawn and 15 cubic centimeters serum injected (Mulford's); the effect was not so marked; Rockefeller Institute serum had previously been used.

February 7 and 8—Symptoms: Headache continues.

Signs: Temperature, 98.4°–103° F.

February 9—Spinal fluid: 45 cubic centimeters withdrawn; 15 cubic centimeters serum injected; fluid much clearer; organism obtained in pure culture.

February 10—Temperature dropped to normal; no headache or other symptoms.

March 7—Discharged to duty; perfectly well and strong; sick 35 days; no sequelæ.

In the above cases ice bags locally, morphine and bromides as hypnotics, and tincture digitalis as a heart tonic were also used in the treatment.

It will be seen that marked improvement followed every injection of serum in both cases. In the first the disease was unmistakably arrested in a progressive course for the worse by one injection of serum.

A CASE OF LEPROSY ON BOARD THE U. S. S. VILLALOBOS.

By Asst. Surg. D. H. Noble, United States Navy.

Lee, Chin, a mess attendant, second class, United States Navy, age $27\frac{5}{12}$ years, was admitted July 15, 1911, with anæsthetic leprosy of right foot and leg and left hand.

Family history: Patient is married and states his wife is free from any signs of disease. Both parents are dead, but no satisfactory facts regarding cause of death can be obtained. One brother, free from disease.

Patient, during former enlistment, served four years in Guam.

Leprosy is prevalent among the Chinese, and he has been without doubt exposed to the infection by close association with those affected.

The medical officer noticed swollen and erythematous areas on patient's hands and examination elicited the following clinical history and symptoms as taken from the health record under date of July 15, 1911:

According to patient's statement, in June, 1909, he noticed an eruption on the right leg which he considered to be dhobie itch, and was under treatment at the time for about two months and was cured; but ever since that time the leg has been more or less scaly and "dead." He states the erythematous areas on hands have developed within the last four or five days. Patient's statements are considered to be unreliable, and he has concealed his condition through fear of being discharged from the naval service. There is an indurated scar on penis, posterior to the corona glandis, and marked general glandular enlargement. It is probable that he became syphilitic three years ago and this fact may influence the character of the present eruption. He has never experienced any pain or discomfort, except that caused by partial anæsthesia over the involved areas.

Physical examination.—On the dorsal surface of the left hand there are areas of erythema, swelling and induration over the first and second phalanges of thumb, over the base of first phalanx of index finger, over the knuckle and first phalanx of middle finger, and base of little finger. An indurated, leathery, erythematous area one-half by three-quarter inch over base of third metacarpal bone, and a reddened area over the fifth metacarpal bone.

All these areas are markedly anæsthetic; the one over the third metacarpal bone shows absolute anæsthesia. There is a small erythematous area over first phalanx of right index finger. A pigmented, thickened, anæsthetic area over upper eyelid and superciliary region, which started as a small erythematous patch over the site of a pigmented scar, the result of a blow received about one year ago, but just recently this became thickened and indurated. Small nodules can be noted on palpation.

This lesion has had the appearance of keloid formation following injury. There has been no ulceration of these lesions with the exception of front of right leg, where the scars of former ulcerations are present.

The nasal septum shows marked redness and injection, but no ulcerated lesions were demonstrated, although there is present considerable discharge from nasal cavities.

Right leg: There is marked pigmentation, induration, and plaque-like infiltration over instep and surrounding ankle. There is a leathery infiltration of dark-brown color over the front of leg and posterior inner surface. On the posterior, inner surface, the leathery, copper-colored infiltration extends up as far as the lower third of thigh. There is a general scaly condition and pigmented scars on front of right leg. The foot and ankle are anæsthetic, which anæsthesia extends over the areas involved as far as lower third of thigh. Knee jerks are present and the toes are not anæsthetic. Microscopical examination of tissue from superciliary region, stained with carbol-fuchsin, decolorized with acid alcohol and counterstained with a saturated aqueous solution of methylene blue, shows that there is present, in great numbers, an acid-fast bacillus, shorter than the tubercle bacillus, many with attenuated ends. These straight rods occur in dense clusters and some cells are crowded with them. Many bacilli are free and some have a slightly beaded appearance. No other bacteria noted.

Patient with his effects was transferred immediately to St. Vincent's Hospital at Kiukiang, China, and isolated.

The above diagnosis is confirmed by Dr. A. C. Lambert, of Kiukiang, China, who is familiar with the manifestations of leprosy among the Chinese.

The patient's quarters were disinfected with bichloride solution. Sides, canvas, and decks were thoroughly scrubbed with solution. Effort was made to have all his personal effects collected as soon as the case was suspected and none of his effects remain aboard.

All indicated measures in the line of destroying the infection aboard have been taken. Crew's living quarters, water-closets, wash-rooms, the galley, pantry, wardroom, and officers' rooms cared for by patient were subjected to surface disinfection. Personal effects of all Chinese mess attendants were subjected to formaldehyde gas disinfection. All personal effects of the officers waited on by patient have received attention with a view of eradication or destruction of any infection which the patient may have carried to them while in the performance of the duties of his rating.

[Attention is invited to a review which is interesting in its relation to this report. It appears on page 502 of this number and is an abstract of a paper, "The mode of transmission of leprosy," by T. Lindsay Sandes, A. M., M. D.—Ed.]

GANGOSA IN A CHILD.

(See page 481.)

A CASE RESEMBLING GANGOSA IN WHICH A TREPONEMA WAS FOUND.

By Passed Asst. Surg. P. S. Rossiter, United States Navy.

[From the United States naval station, Tutuila, Samoa.]

On August 20, 1909, a native child was brought to the clinic suffering with what appeared to be a case of gangosa. The following history was obtained:

T., a female Samoan, aged 2 years, had been sick for two months. According to the mother's statements the child had had yaws but no other sickness. A muco-purulent discharge from the nostrils was first noticed and lasted for about three weeks. Then an ulceration of the nose appeared, which had progressed during the succeeding five weeks. One brother of the patient, 4½ years old, is in good health. No member of the family has had a similar disease.

Upon examination it was discovered that the cartilages and soft parts of the nose on the right side were partly destroyed. The ulceration had almost obliterated the nasal septum and had destroyed the anterior portion of the hard palate. It had also made extensive inroads upon the right superior maxilla and encroached on the upper portion of the lip. The temperature was 99.2° F.

The ulcerated surface was carefully washed with a solution of sodium bicarbonate and a number of smears made. The following day more smears were made, and as the mother had to make a journey to a neighboring village and would not be able to bring the child to the dispensary for treatment for several days, she was given a 30 per cent calomel ointment with instructions to apply it daily to the ulcerated surface and to return as soon as possible. The case was not returned and the child died one week later.

All of the smears were examined, and they were found to contain treponema; also many bacilli and cocci. A photograph of this case, which was taken at the first visit, appears opposite page 480.

A CASE EXTENSIVELY BURNED.

By Passed Asst. Surg. Norman T. McLean, United States Navy.

The explosion of a saluting charge on the open deck of the U. S. S. *Dolphin* caused extensive burns to two men. One of these patients was treated as follows, and was discharged to duty well in 16 days.

Patient suffered from burns of the first degree over face, forehead, and lower abdomen; of the second degree over flexor surfaces of both upper extremities, hands and fingers, and of third degree on both shins. He was given a hypodermic injection of morphine immediately after the accident and burned surfaces were covered with vaseline. Two hours later he was placed on the operating table and given chloroform anæsthesia. Burned areas of the first and second

degrees were thoroughly cleansed by softly swabbing with green soap and boric-acid solution, followed by a spray of hydrogen peroxide. They were then dried with sterile cotton, Senn's powder applied, and all covered with voluminous bandages. Third degree burned areas contained considerable embedded powder and a few pieces of brass, which were picked out. The areas were washed thoroughly with green soap, then with boric-acid solution and hydrogen peroxide, dried and dressed as above, using an excess of the powder.

Patient was almost entirely free from pain after coming out of the anæsthetic, and continued so. On the fourth day all the burns were redressed with Senn's powder. Burned areas of the first and second degree were almost well, those of third degree in good condition, with no signs of pus. On the seventh day the dressings were removed from all minor burned areas and Senn's powder was used for dusting from that time on. Granulation was well established on third-degree areas, with some exuberant places. Gauze soaked in 5 per cent argyrol solution was applied and was kept moist with this solution until the sixteenth day, when it was removed. Surfaces were entirely healed and required no further dressing other than protection for new scar tissue.

The second patient, with essentially the same areas involved and to the same degrees, received the same treatment up to the third day, after which time he was given frequent boric-acid ointment dressings. He was discharged to duty on March 10, convalescence requiring 11 days longer than the first case, owing to suppuration occurring over third-degree areas.

The speedy convalescence and absence of pain and suppuration with the use of Senn's powder and argyrol suggest that this method may be of good service in the treatment of burns of these types.

ACUTE PEMPHIGUS FOLLOWING VACCINATION.

By Passed Asst. Surg. REYNOLDS HAYDEN, United States Navy.

A negro carpenter, age 60, was vaccinated, in common with all other employees of this station, on June 9, 1910. Patient had a good take with a rather bad arm, remained at home for about two weeks and dressed his arm himself. On June 27 he came to the dispensary and had a dressing applied to his arm. At this time there was evidence of some local infection at the site of vaccination, probably caused by himself while dressing his arm during the preceding two weeks. There were no constitutional symptoms, and according to his statement there had been none during the preceding two weeks other than those usually encountered in a case of successful vaccination. The man returned to his work at this time and had his arm dressed

by me on July 5 and July 8, by which time a good crust had formed over the sight of vaccination. Patient had had no constitutional symptoms during the week, and his arm, while tender to the touch, was not painful.

That night patient had some headache, and the following morning, four weeks after his vaccination, a bullous eruption appeared on his left arm. These bullæ were much thicker upon the forearm than on the upper arm, were discrete, attended by some slight itching, had no areola, and sprang from an apparently normal skin. At first the blebs varied in size from a pea to others having a base about the size of a dime. They increased rapidly in size, many becoming as large as a walnut, or even larger. By the second day the bullæ had appeared on the legs and trunk, especially in the left axilla. During the third and fourth day the entire body became covered with these bullæ, varying in size from a pea to a walnut. They were especially thick and tended to become confluent in both axillæ and groins. Patient had no fever or chills. Pulse varied between 75 and 80 for first few days, then patient became increasingly prostrated, pulse averaging 96.

On the fourth day blebs appeared on the face, neck, and scalp. There were large blebs over each eye, and patient stated that a film appeared to grow over each eye, making him partially blind. This condition later improved. The back and buttocks became similarly affected at same time as the face. The contents of the smaller blebs were clear, and that of the larger ones was somewhat turbid. There was no regularity in the distribution of the bullæ.

A number of the blebs were pricked with a needle by the patient's wife and the contents removed. Those not so treated burst in four or five days. In either case the covering of the blebs dried up and fell away, sometimes forming scabs which soon fell away, in both cases exposing a red base. The body and extremities in many places resembled a severe burn or scald, being covered with large denuded red areas, surrounded by blebs of various sizes. This was especially the case in the axillæ and groins. The right axilla presented an area extending downward on the thorax and arm for a distance of about 6 inches and antero-posteriorly on the chest for about 10 inches, the whole resembling a third-degree burn.

On the legs, head, and forearms there was not the tendency to become confluent, as on the trunk. The blebs, while showing the red base as before, healed more quickly afterwards, the process of healing taking about two weeks. Toward the end of the first week several blebs developed in the mouth, one small one on the tongue, and one large one on the side of the pharynx. The latter, when it burst, "nearly drowned him," according to his wife.

Patient became increasingly prostrated. For a week he was in a semiconscious condition for the most part, but not hard to rouse for his food and treatment. For two days, while the bullæ were in his throat and mouth, he was able to take only liquid nourishment. His temperature varied from 96° F. to 99.8° F. There was no vomiting. Urine slightly reduced in quantity and showed traces of albumen. During the third week he was frequently delirious, but with the improvement under treatment of the large burnlike areas he did not have this symptom. There was tenderness, resembling that of a severe burn, over the larger red areas where the bullæ had ruptured.

Between two and three weeks after the disappearance of the first crop of bullæ, they began to recur over the same areas and the back was covered with a second crop of bullæ, large and small, some confluent as before. Several burst and exposed the red layer as before. There was no hemorrhage into the blebs themselves, but there was a slight amount of hemorrhage from a number of the reddened surfaces left by the bursting of the bullæ. Blebs also reappeared on the face, neck, arms, and legs, frequently at the site of previous ones.

August 5.—Since the last dressing on July 8, the vaccination site has been perfectly normal and covered by a thick crust which is still strongly adherent, nearly five weeks after its formation. There has been no swelling, pain, nor induration about the vaccination area for three weeks. Microscopical examination of the contents of the bullæ was negative, some leucocytes in the more turbid ones being the only objects discovered. Blood examination was likewise negative for bacilli. Cultures from the bullæ and from the blood on gelatin, agar, and blood serum were negative. No examination was made of the discharge from the site of vaccination as it had ceased before the present symptons began. Autoinoculation does not seem to have been responsible for the spread of the bullæ.

The treatment has been largely symptomatic, stimulation internally and carbolized vaseline to the burnlike, areas with sponge baths of water and alum solutions. Arsenic has been given in increasing doses of Fowler's solution and the patient has apparently slightly improved under its use during the past two days. Because of his surroundings, it has been impossible to give a continuous salt bath. The general symptons have been practically those of a severe burn, one extending over a large body area.

September 9.—The patient steadily improved under treatment. Fowler's solution was given in increasing doses up to 10 drops three times a day. The remainder of the treatment was as outlined above.

A few more bullæ appeared upon the left arm, back, and buttocks. These were much smaller than before and ran a similar course. Since their disappearance, the man has been steadily gaining in strength, is now up, and moves around very well. His recovery is apparently assured and he should be able to resume his work in about two weeks.

The case, while quite severe for the first month, responded to treatment in a most gratifying manner. The new skin covering many of the denuded areas is almost totally lacking in pigment, and the man now presents a most peculiar mottled appearance.

The unexpected recovery of the man, in view of his age, 65, leaves the question of ætiology much unsettled.

There have been no symptons of generalized vaccinia nor any of sepsis in the usual sense. The infection of the site of vaccination appeared to be purely local and responded readily to treatment. Nor does it appear to be due to the virus, as the condition did not develop for four weeks after vaccination. Demmè found diplococci in the contents of the bullæ and in the blood of a case of acute pemphigus, but they were not present in this case. Howe, of Boston, reports nine cases in persons who had been recently vaccinated, the time of the eruption varying from 3 weeks to 16 weeks after vaccination. He believed the cause to be an infection introduced at the time of or following vaccination. In this case, it hardly seems possible that the infection, if present, could have been introduced at the time of vaccination, as the same technique was followed in his case as in that of seven hundred and odd cases vaccinated at the same time with no bad results. Nor does it seem possible that the virus was the cause, as the point used in his case was one of seven hundred and odd points used at about the same time with no other untoward results. That the disease may, however, be due to an infection is shown by the fact that Pernet and Bulloch report three cases of acute pemphigus in butchers, all of whom had wounds which continued to suppurate up to the time of the outbreak of pemphigus. Stelwagon reports two cases following vaccination, the time of eruption being 2 to 4 weeks following vaccination, respectively. A number of other cases have been reported by Bowen, following vaccination in children, in whom the disease does not appear to have attacked the trunk nor to have been so severe. Howe's cases were all adults, the mortality being 66⅔ per cent. The source of the poison, whether from the virus or infection at the time of or after vaccination, I am unable to state, but am inclined to believe the latter. No symptons nor history of syphilis or tuberculosis are present.

TWO INTERESTING CASES ON THE U. S. S. PRAIRIE.

By Passed Asst. Surg. C. C. GRIEVE, United States Navy.

Case I.—P. F. S., a first-class fireman, aged 44 years, was admitted to the sick list on April 20. He was born in Ireland, and had 19 years' service in the United States Navy.

He gave a history of a chancre about 19 years ago, followed by a slight rash, but no other symptoms. He took treatment for about two weeks at that time, and has taken no specific treatment since.

The patient complained of slight pain in the left arm, and inability to use the arm or bend the elbow. He had charge of the engineer's storeroom, and as his duties did not require the use of the painful arm, he had rested it for some time and had not reported his condition to the medical officer.

Upon examination it was found that the forearm was held at right angles to the arm, and that there was ankylosis of the left elbow joint. The joint was also very much enlarged and painful on pressure. A diagnosis of syphilis was made and the patient was given increasing doses of potassium iodide, and 2 drams of mercurial ointment as an inunction daily. Passive movements of the joint were attempted.

On April 25 the three accompanying X-ray photographs were taken on the U. S. hospital ship *Solace*. The signs of periostitis and the exudate in and around the joint can be seen in the pictures. In addition to the mercury and potassium iodide, the patient was given tonics to improve his general health.

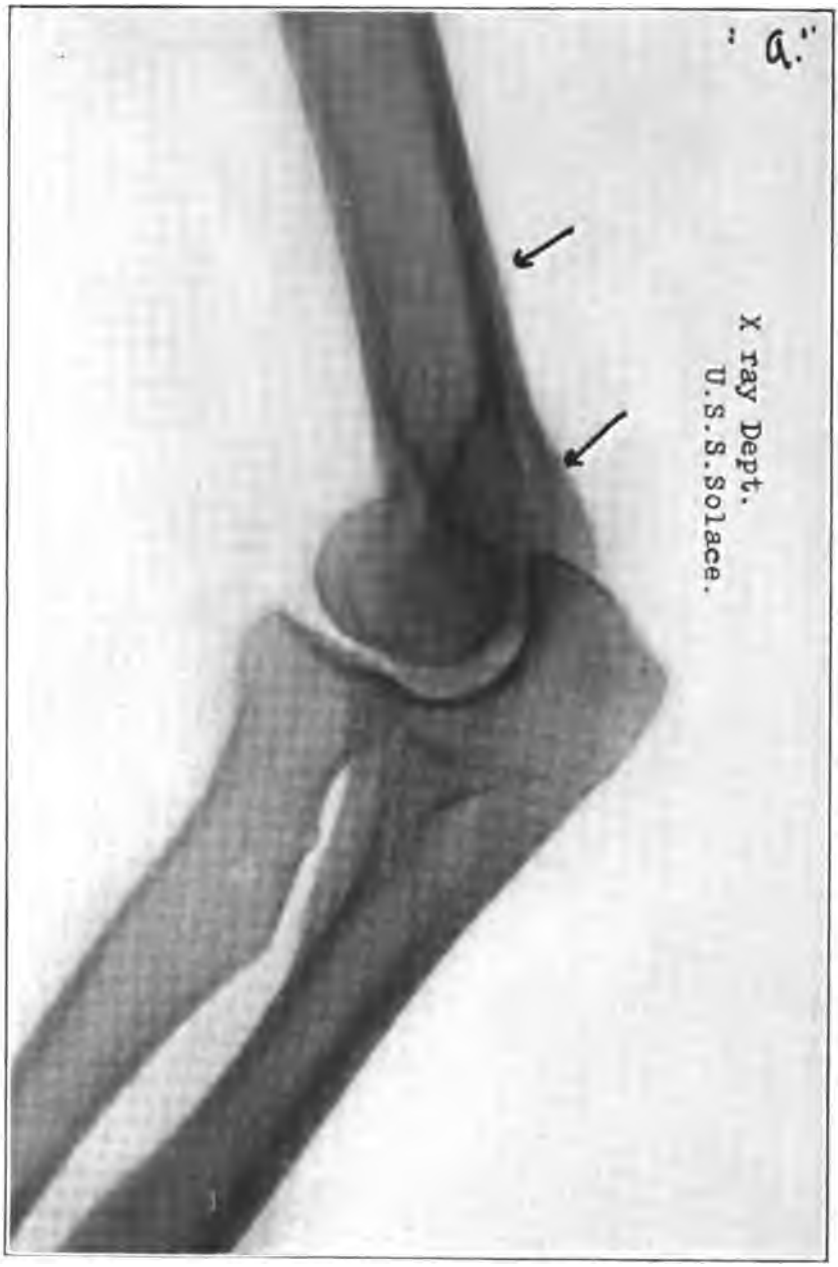
The condition of the patient had improved by May 1. The elbow joint had decreased in size, and some degree of flexion and extension could be made by passive movements. The potassium iodide was increased to 40 grains three times a day, and the inunctions of mercurial ointment and the tonic were continued.

The next clinical note made on May 10 showed that there was a gain in weight; that the mental condition of the patient, which had formerly been dull and melancholy, had improved; that there was practically no pain in the joint, and that he was gradually regaining the motion in the joint.

Examination of the joint on May 15 elicited no pain in the joint upon motion, and it was seen that he would regain full use of the joint.

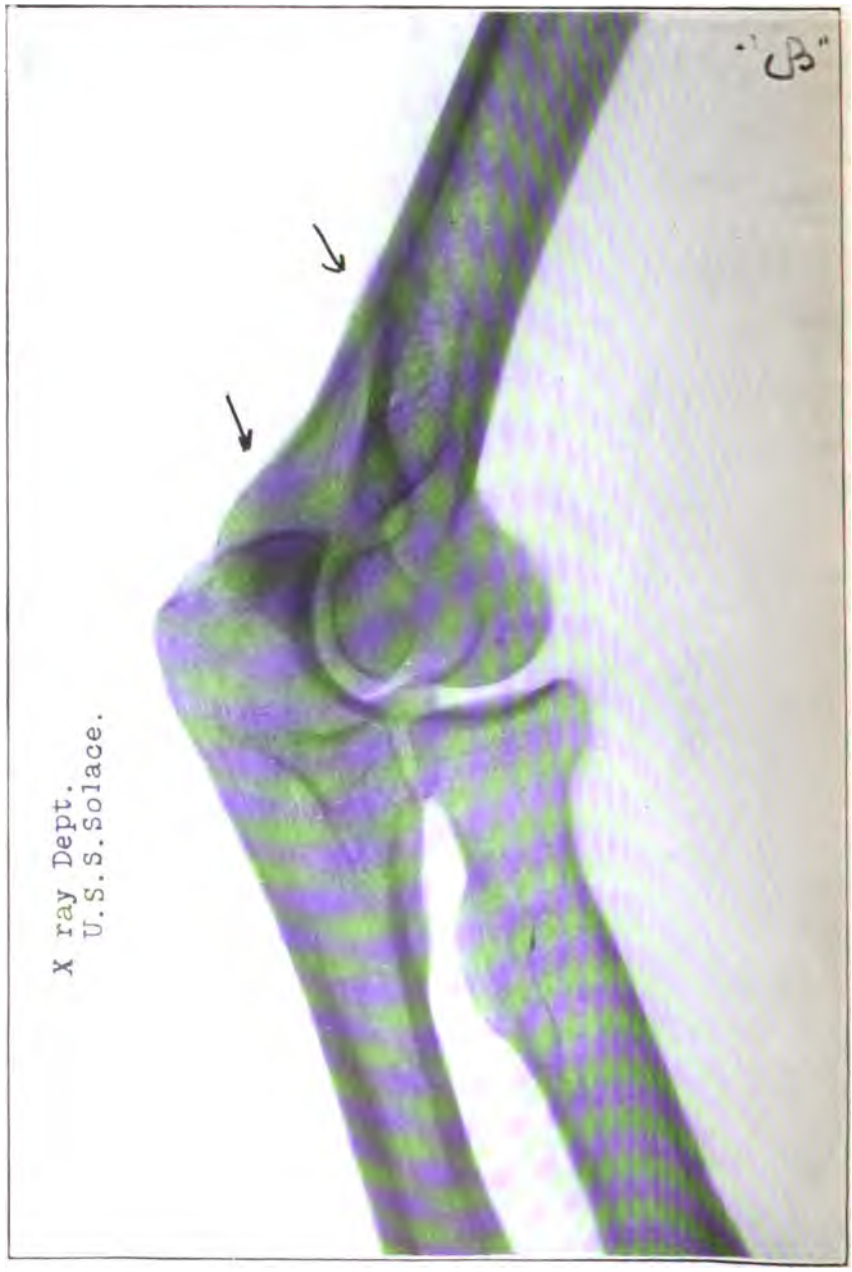
On May 16 the patient was discharged to duty, but treatment and observation were continued. The X ray showed that the exudate around the joint was being absorbed.

On this date, July 1, the patient seems to be in good physical condition, and the movements of the joint are normal. The mixed treat-



PERIOSTITIS AT THE ELBOW JOINT.

(See page 486.)



PERIOSTITIS AT THE ELBOW JOINT.

(See page 486.)

ment will be continued; the movements of the elbow joint will be used, and he will be kept under observation.

This case is interesting on account of the long interval of freedom from any symptoms of syphilis, and because of the rapidity with which the condition cleared up under proper treatment.

Case II.—C. A. C., an ordinary seaman, aged 19 years, was admitted to the sick list on May 13. He was born in Georgia, and had nine months' service in the United States Navy.

He was found at 5 a. m. in a comatose condition. Eyes were wide open, pupils equal, and respirations, pulse, and temperature were normal. There was no paralysis or ankle clonus. Reflexes were apparently normal, Babinski sign was negative, and both feet were inverted. There was retention of urine, but an examination of a specimen obtained by catheterization showed it to be normal.

After a careful physical examination, a tentative diagnosis of hysteria was made. Various tests were applied but he could not be aroused. The patient must have had some headache during the night, for when he was found in the morning he had a wet towel tied around his head. Later he was given one-twentieth of a grain of apomorphine hypodermatically. This caused him to perspire freely, close his eyes, and turn on his side. He did not vomit and neither could he be aroused.

Patient recovered from his coma 18 hours after being discovered, but was unable to speak or whisper. He had full control of the movements of his tongue, his hearing was good, and he was able to write. Complete eye examination showed nothing abnormal.

This young man is usually restless, nervous, and of a retiring disposition. He uses neither alcohol nor tobacco, rarely ever mixes with his shipmates, reads and studies diligently when off duty, and had not been ashore for three months.

Upon awakening on the morning of May 17, he was able to speak for the first time since the initial attack. He says that the entire day of May 13 was a blank to him, and that later when he tried to speak he could not, despite his earnest efforts. During the next few days the patient was very nervous, but otherwise improved steadily. Tonic prescribed.

On May 22 he was discharged to duty. He was kept under observation, however, and encouraged to engage in exercise, and to enter into the ship's sports.

On this day, July 1, the young man is in much better mental and physical condition; he has gained in weight and strength; is going ashore with the ship's baseball team, and he now takes a part in the ship's sports and does his duties cheerfully.

AN ATYPICAL CASE OF TYPHOID FEVER.

By Asst. Surg. L. W. JOHNSON, United States Navy.

The following is an interesting atypical case of enteric fever in which the diagnosis made upon signs and symptoms differed much, indeed almost inexplicably, from the diagnosis made upon the findings at necropsy. It may prove as interesting to others as it was to those who saw it:

O. H., male, aged 22 years, was serving aboard the U. S. S. *Minnesota* when he sickened. He was noticed, quite accidentally, to be somewhat indisposed on July 21. His temperature was 101° F., pulse 100, respiration 26, and he did not wish to go to bed, saying that he felt perfectly well.

Physical examination showed face flushed, eyes bright, conjunctivæ congested, tongue moist and clean. On inspection, the chest showed considerably decreased expansion on the right side; heart normal in size and position; no evidence of valvular disease. Palpation normal except at base of right lung, where vocal fremitus was much lessened. Percussion was normal except at right base, where dullness was found; there was no Skodaic resonance above this area. Auscultation showed breath sounds almost absent and a fine crepitant râle just above this area, but it was not constant. Abdomen showed no distension or tenderness, no rash; spleen not palpable. No albuminuria.

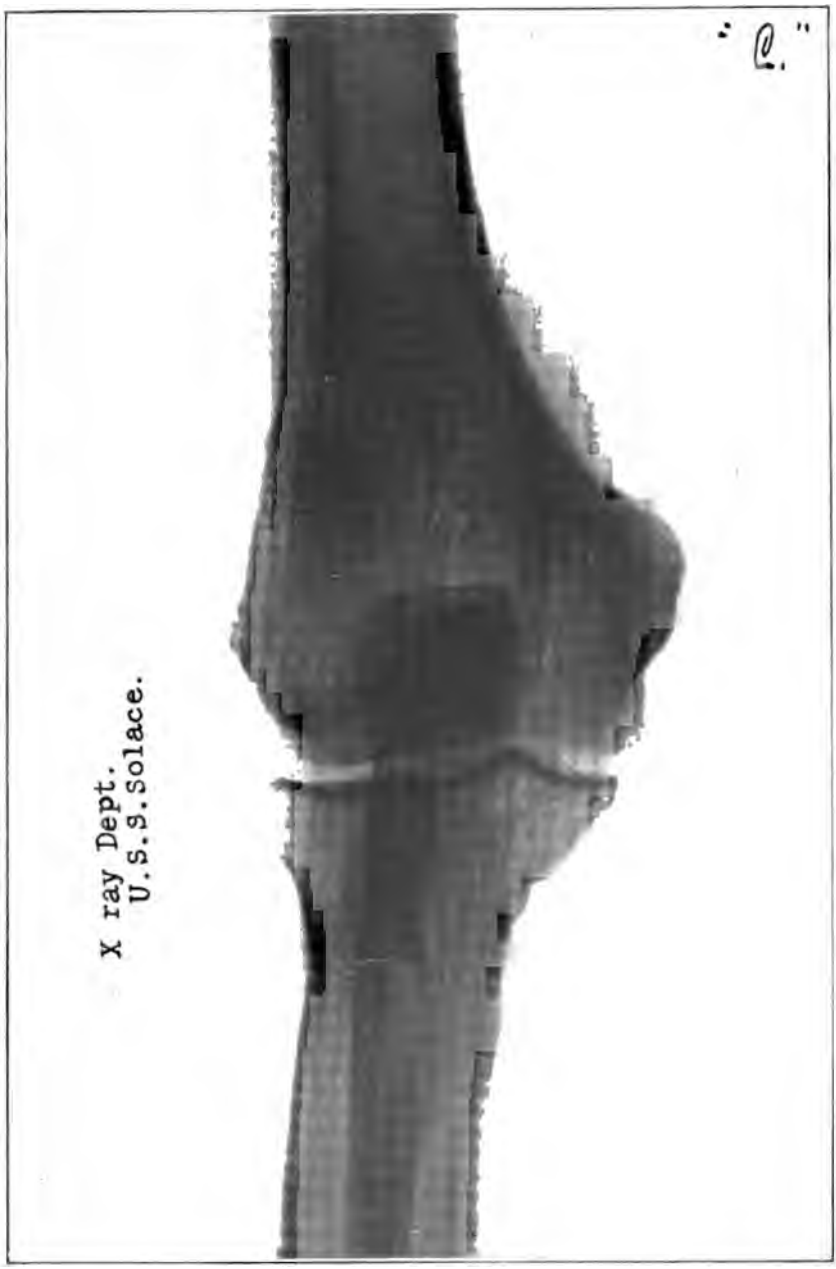
At 4 p. m. the temperature was 104° F., the following morning it was 103° F. There was slight cough without expectoration; bowels moved normally. For two days the temperature remained around 100° F., with slight evening rise; all the symptoms remained the same, but he felt weaker. Typhoid was suspected; but no evidence could be found other than the facies, which was that of typhoid fever. Treatment expectant, liquid diet, no medication except an opiate for sleeplessness. Patient was kept in a tent on deck, as the weather was warm and favorable.

On the fifth day the temperature was normal at 8 a. m., condition otherwise the same. During the morning he passed into a state of low and muttering delirium. In the afternoon his heart became rapid, weak, and irregular. He died at 8.20 p. m., July 25.

The diagnosis of lobar pneumonia, right lung, with pleurisy, was concurred in by the three physicians who watched the case.

Autopsy record.—Body of a young adult male, dead 3 hours. Rigor mortis slight, very little abdominal fat, muscles bright red on section, fluid blood flows from cut vessels.

Right lung.—Pleura shows adhesions at apex and at base posteriorly; no excess of fluid; surface smooth and shiny throughout; few old scars at apex. Upper lobe, on section, is red with gray mottling; bloody froth exudes from cut edges. The middle and lower lobes are similar and show no pathologic change; pieces of the lung float in water. Several bronchial glands are enlarged, pigmented, and hard.



PERIOSTITIS AT THE ELBOW JOINT.

Posterior view of elbow showing exudate in and around the joint. (See page 486.)

Left lung.—Few old adhesions at apex and at base posteriorly; condition otherwise normal.

Heart.—Pericardium contains small quantity of fluid blood, heart is relaxed, and the chambers contain recently clotted blood. The valves are competent; muscle normal in color and consistence. Coronary arteries patulous and show no clots or sclerosis.

Abdomen.—On opening, all the organs were seen to be firmly matted together by old fibrous adhesions; the omentum firmly attached to the liver and intestines.

Liver.—Firmly adherent to diaphragm and omentum; could not be separated without tearing the liver substance. The organ is normal in size and consistence. Gall bladder firmly adherent throughout; contains 50 cubic centimeters of dark fluid bile; ducts are patulous.

Spleen.—Closely bound down to liver and kidney; tissue torn in separating; normal in size. Substance is pulpy and congested.

Right kidney.—Universally adherent; scar near upper pole; capsule strips easily, leaving a dry surface; moderate degree of acute congestion; fat normal in amount and appearance.

Left kidney.—Similar in all respects to the right.

Stomach.—Closely bound to liver and intestines by old adhesions; shows no pathologic change.

Intestines.—Firmly adherent to all organs and the coils matted together; no evidence of recent adhesions. The ileum is generally congested and has several thickened and inflamed Peyer's patches, some of which are ulcerated. Other parts of the intestine show a moderate degree of congestion. Many mesenteric glands are enlarged and are of a cheesy consistence with calcareous centers.

Pathological diagnosis.—Typhoid fever, with general abdominal adhesions, resulting from an old tubercular peritonitis.

Enlargement of the spleen and its descent on deep inspiration were evidently prevented by adhesions. The absence of abdominal distention, rose spots, and diarrhea, together with the rapid fall of the temperature to normal, obscured the diagnosis of typhoid in this case. The presence of the lung symptoms is not made sufficiently clear by the autopsy findings. The diagnosis of pneumonia was based on the physical signs, despite the moderate fever falling by lysis and the absence of severe cough or expectoration.

TOLERANCE OF THE PERITONEUM RARELY SEEN.

By Passed Asst. Surg. P. R. STALNAKER and Passed Asst. Surg. G. W. SHEPARD, United States Navy.

On the afternoon of March 30, 1911, it was necessary to treat a man and a woman, natives of the island of Culebra, P. R., who were both gravely wounded. It seems that in a fit of jealous rage the man had plunged a knife into and through the woman's body and then attempted to terminate his own life by stabbing himself in the abdomen with the same knife. The woman died shortly after the arrival of medical aid, so that attention was given to the man, who is a native Porto Rican, 23 years of age, rather small of stature, but muscular and well built. He was employed on a small sailing sloop and carried, as all of these men do, a rather formidable, if

crudely made, knife. The blade was of heavy steel, about 10 inches long, and about 2 inches wide. The handle was of wood and had evidently been made and attached to the blade by the man himself, for it consisted of two pieces and was secured by being tightly wound with cord. When seen, directly after the infliction of the injury, the knife was covered with rust and dirt. The man was found lying upon the porch of a native house with his jacket rolled and snugly tied about his waist. Examining him upon the spot, a wound about 1½ inches long was found midway between the umbilicus and ensiform cartilage and about 1 inch to the left of the median line. Through the wound was protruding a slip of omentum. There was very little hemorrhage and nothing to indicate a grave condition more than a slightly rapid pulse. The wound was covered with a piece of sterile gauze, leaving the protruding omentum as found, and the man transported on a stretcher to the hospital, a distance of about a mile. He was immediately placed on the operating table and the wound enlarged, both above and below, so as to give a good exposure for the examination of the viscera of the epigastrium, none of which were found to be injured. The wound was closed, leaving a small gauze drain, which was removed on the second day.

The remarkable part of the subsequent history is that after the nausea, following the anæsthetic, had passed, the man did not vomit once, the temperature did not exceed 100° F. except on one occasion, when it was found to be 101.8° F., and fell promptly following an enema. The pulse was never above 80 per minute, the usual count being between 60 and 70 per minute, and in every respect the case progressed as a perfectly clean and planned celiotomy should do. The stitches were removed on the eighth day, and the man was turned over to the judicial authorities on the fourteenth day.

NOTE ON TINCTURE OF IODINE.

By Surg. RAYMOND SPEAR, United States Navy.

Moynihan has experimented for the past two years with all strengths and all modes of applying tincture of iodine to the skin for the purpose of skin disinfection.

He has compared the healing of wounds in cases in which iodine was used with cases in which the skin was prepared by washing with soap and water, Harrington's solution supplemented by an alcoholic solution of biniodide of mercury 1–500. The healing of the wounds in the cases in which iodine was used almost always was accompanied by some inflammatory reaction and very often there would be a slight discharge of serum. The cases in which Harrington's solution had been used almost invariably healed without any inflammatory reaction or without any formation of serum.

In Moynihan's opinion, tincture of iodine has a distinct place as a skin disinfectant in emergency surgery; but for a deliberate disinfection of the skin for operative procedures, washing with soap and water, Harrington's solution, followed by an alcoholic solution of biniodide of mercury 1–500, is preferable.

Prof. Lanz, of Amsterdam, is of the same opinion as Moynihan as regards tincture of iodine as a skin disinfectant. He believes that the peritoneal coat of the intestines is often irritated by coming in contact with the iodine, and adhesions result.

In Bier's clinic in Berlin all operative cases are prepared now by first rubbing the skin with gauze saturated with benzine to dissolve out the dried secretions of the skin. Two separate applications of 5 per cent alcoholic solution of iodine are then applied, the second after the first has dried. At the end of the operation the whole area that has been painted with iodine is rubbed over with alcohol; this prevents possibility of iodine blistering.

NOTES ON SALVARSAN.

By Surg. RAYMOND SPEAR, United States Navy.

Wechselmann, of Berlin, prepares salvarsan for intravenous injection by dissolving the powder in normal salt solution (0.9 per cent) made from fresh, double-distilled water.

About 20 cubic centimeters of salt solution are placed in a beaker. The salvarsan is dropped into this solution and allowed to stand without agitation. It has been found that the powder dissolves better and more completely if it is not shaken. After it has dissolved, 4 cubic centimeters of normal sodium hydrate solution are added. This causes a precipitation. The fluid is then gradually clarified by adding, drop by drop, the sodium hydrate solution until a clear solution has been obtained. This is filtered and the filter paper washed with the salt solution. The salt solution, which is also filtered, is added to the solution of salvarsan up to a total quantity of about 150 cubic centimeters.

For the intermuscular or subcutaneous injection, Wechselmann prepares his salvarsan by putting the powder in 10 cubic centimeters of normal salt solution and rubbing it up in a mortar. He divides this solution into two parts. To part one he adds normal sodium hydrate solution until it clears; the second part is then added to the first part gradually until the solution becomes neutral. Litmus paper is used in testing the degree of alkalinity. The solution looks like an emulsion and is thick. Injected while in this state of neutrality, very little pain is experienced.

In Wechselmann's experience 5 per cent of syphilitics suffer from optic-nerve involvement. He uses salvarsan in these cases, but in

0.1-gram doses subcutaneously at intervals of one week. Salvarsan is contraindicated only in severe diseases of the blood vessels.

In the United States naval hospital in Washington four intravenous injections by this method have been given and in none was there any rise of temperature or unpleasant symptoms. One of these cases presented a large Hunterian chancre, all traces of which practically disappeared 10 days after the injection. The amount of salt solution used was 300 cubic centimeters.

In this hospital a large vein is exposed in the left elbow by making an incision about 1 inch long over the vein after it has been distended by a tourniquet placed about the middle of the arm. The vein is freed and clamped at the distal end of the wound; a second clamp is applied about ½ inch above this point, taking care to have the portion of the included vein distended with blood; a small vertical incision is then made in the vein and the silver canula with a bulbous end is slipped into the opening; the second clamp is opened and the canula is pushed well into the vein. A silk ligature which has been previously passed under the vein is now tied over the canula and holds the vein tightly to the canula. The vein can now be divided just above the first clamp and the distal portion ligated. Salt solution is first run into the vein and, if all is tight, the salvarsan solution is then introduced. All the solution of salvarsan can be washed into the vein by adding a little salt solution. The vein is now clamped with two small clamps beyond the end of the canula and cut between the clamps and the upper end ligated. The wound is then washed out with salt solution and closed by a couple of interrupted sutures.

By this method there is no possibility of air getting into the vein. The solution of salvarsan goes directly into the vein, none of it is lost, and none of it can stray into surrounding tissues to possibly cause a painful wound.

CURRENT COMMENT.

INSTRUCTIONS RELATIVE TO MEDICAL RETURNS.

It has been noted in the reports of death (Form N) that two or more causes are frequently assigned, each being given equal prominence; also in some cases the assigned cause of death does not correspond with the admission to the sick list as shown by entries on the health record and other returns.

It is obviously desirable that these various reports should agree, otherwise it may occur that the statistical reports of the bureau will show a death from a disease for which there is no admission.

In a case of a death from the anæsthetic during an operation for a condition not *per se* of a serious nature, the death was returned under the latter, rather than as from "venenum neuroticum," which was the direct cause of death. In this and similar cases the case should be discharged "C," admitted with the above diagnosis and discharged "DD" on the same date.

Considerable irregularity is apparent in the assignment of diagnosis when two independent diseases coexist, and also in recording cases in which complications or sequelæ occur. In the former case preference should be given to the graver affection or to an infectious disease.

When a case is admitted for an immediate sequela or complication of a primary disease, the entry should be under the latter. For example, gangrene occurring in a diabetic should appear under "diabetes mellitus."

In cases where the clinical diagnosis is conclusively proven erroneous by the pathological findings, the diagnosis should be changed to conform.

When the medical officer is in doubt as to the exact nature of the disease, as in the case of suspected tuberculosis where the clinical symptoms are those of chronic bronchitis only, or in a case of tuberculosis where the clinical diagnosis may be either the pneumonic or the miliary form, the less grave diagnosis should receive preference.

As the diagnosis of tuberculosis or syphilis once made constitutes an integral part of the individual's health record and may result in a failure to secure otherwise merited promotion, pension, or life insurance, these diagnoses should be made only upon a well-founded basis. In case these diseases are suspected but confirmation is lacking, such

views may be expressed by inclosing the suspected diagnosis in parentheses, followed by an interrogation mark, e. g. (tuberculosis ?), or by remarks in the body of the record while the case is carried under another diagnosis, as may be indicated, but in all cases the diagnosis under which carried must be evident.

As stated in the former issue, some medical officers neglect to make the proper entries, or make them in improper places, in the health record upon the termination of service or upon promotion in the case of officers.

There is also some irregularity in the time and manner of closing the health records of officers promoted. This record should accompany the officer when appearing before a board for physical examination, in order that the board may have the complete medical record.

The record should be returned to the custody of the medical officer of the station to which the officer is attached, or if unattached, forwarded to this bureau, but the record should not be closed until actually promoted, when a new record should be opened.

CLINICAL CARDS.

Unfortunately there does not seem to be a proper appreciation of the value of the clinical cards, and some medical officers do not seem to know just what is wanted. Therefore the object of this article will be to clear up the evident misunderstanding.

The clinical cards are intended for the collection of clinical data and are not used for pension purposes in the bureau. They are a reference for information regarding the clinical features of each case (ætiology, symptomatology, duration, prophylaxis, treatment, etc.), and are not necessarily to be closed upon the patient's return to duty, but should be continued until the patient is clinically cured. Reference to line of duty should be omitted. A concise history, with details of treatment, is desired.

The term "clinically ready for disposition" is not readily understood. For example, a given case may have been operated upon, and in about 20 days may be in good shape, and ordinarily would be discharged from a civil hospital to complete his convalescence at home, but in the naval service a man must be able to do strenuous work when he goes to duty, and therefore he is kept in a naval hospital for a week or 10 days longer, so that he may completely regain his strength. This obviously makes the number of sick days greater. To get a basis of comparison with civil hospitals the number of sick days between the day of admission and the date of clinically ready for disposition would give the average duration of treatment. The date of a patient's being "clinically ready for disposition" is in ordinary medical and surgical cases a few days earlier than his return to duty.

In venereal cases, however, where a man is admitted to the sick list and discharged the next day for record, his treatment is continued until he is cured, and here the date of clinically ready for disposition should be *later* than the day of discharge to duty. The venereal cases are those in which the poorest cards are made out. The cards are not to be closed with the too frequently used expression "usual symptoms and treatment," having the dates of admission, of return to duty, and clinically ready for disposition all on the same day (thus indicating that the case is cured in one day), *but are to be continued until the case is apparently cured or is discharged from treatment.* Then the day on which the case is cured is the day upon which he is ready for disposition.

If a card is made out on a ship for a patient who is subsequently transferred to a hospital, the card containing the clinical history should accompany the patient to the hospital where it can be continued. This will give a consecutive history, avoid having more than one card for the same case, and also avoid the unnecessary expenditure of time, labor, and cards.

Should two or more medical officers open and close cards for the same case, it will result in that neither of the cards will be complete and that medical officers seeking statistics will have to correlate these cards with much loss of time and patience.

MEASLES IN SAMOA.

In 1893–94 an epidemic of measles occurred in Tutuila, American Samoa, where the disease was formerly unknown. The infection attacked old and young, and the ravages of this usually harmless disease upon the virgin soil of the natives were frightful. The mortality was especially high. This epidemic abated after a time, and measles was not noted in epidemic proportions until February, 1911.

During the latter part of 1910 cases of measles began to appear in the neighboring islands. On December 15, 1910, a case of measles occurred on the steamship *Dawn* in German Samoa. A case occurred on the same boat in Tutuila on January 6, 1911. This case was isolated and the vessel placed in quarantine for one month.

On February 9 the *Dawn*, and on February 11 the *Rob Roy*, brought passengers to Tutuila from German Samoa with clean bills of health. On February 21 two cases of measles developed in Tutuila. One of these patients had arrived on the *Dawn* and the other on the *Rob Roy*.

In spite of all precautions the disease spread like wildfire and in a short time had assumed epidemic proportions. The disease was also reported as being epidemic in German Samoa on February 20, 1911. Owing to the fact that there are but two medical officers of

the United States Navy stationed in Samoa and that it was an impossibility for them to see each case personally in addition to all their other duties at the naval station, the island was divided into districts. each in charge of a member of the United States Naval Hospital Corps, with instructions to disseminate information as to the care and treatment of cases of measles and to report any complications to the medical officers, who then personally treated these cases.

The epidemic increased during the month of March, and about 500 cases were seen. No deaths occurred during this month. By April 30 the number of cases seen by the medical officers and Hospital Corps men reached 1,228. Many cases of bronchitis appeared and a few cases of acute tuberculosis followed an attack of the malady. While the cases of measles were severe, no deaths occurred up to this time. The epidemic spread to the islands of Manua and was at its height during April.

The epidemic gradually subsided and by June 30 was practically at an end. Many deaths (219) resulted from measles, its complications and sequelæ. Dysentery was the most serious sequel.

This epidemic was not so serious as, nor was it attended by, the high mortality of the epidemic of 1893–94, because most of the adult population was immune as a result of the former epidemic, and they were also better able to take care of their sick children during this last epidemic. Not a single case of measles appeared among the Americans on the island.

THE CONSERVATION OF THE PUBLIC HEALTH.

The movement for the conservation of public health which is assuming splendid proportions in our country deserves the most throughtful consideration that physician and layman alike can bestow upon it.

Intelligent cooperation is needed. The wonderful results already accomplished in the prevention of disease should encourage the lukewarm vigorously to direct their energies toward the improvement of conditions so readily remediable. The good news that much of the physical suffering, death, and economic loss which now are taking place is preventable should spread like wildfire and on every hand effort should should be made to reduce the loss. Slow progress toward an ideal is scarcely appreciated by a large mass of well-meaning people who are either unaware of or else have most vague and inaccurate information concerning the actual work being done.

Primarily the campaign must be one of education. Before the masses can be expected to cooperate intelligently even for their own

benefit they must know: (*a*) That certain diseases are communicable and how; (*b*) that these diseases are preventable and how; (*c*) that persons afflicted with these maladies should be early and properly treated and how; (*d*) and that such treatment is available for deserving indigent cases and how. Educate the people along these lines and strong allies will be added to the forces which are fighting communicable disease. The people must know *how*. When they learn, they themselves will be ready to fight. Care must be exercised that their effort be not misdirected, with the consequent discouraging loss of time, effort, money, and morale.

The medical profession must direct the campaign and advise legislators in the enactment of the necessary laws.

Significant is the circular letter recently sent out by one of the large life insurance companies of the country to its medical examiners. Appreciating that the profits of the company are proportionate to the longevity of its policy holders, the letter announces that the company has established a "conservation department" through which, with the cooperation of its medical department, it purposes to "extend such help as it legally may to the public authorities of the country in their efforts to improve the public health, and will give its moral support" to the great movement for the prevention of sickness and loss of human life.

While the company frugally states that "financial contributions can not be made," it urges its medical examiners publicly to stand for improved health conditions, to encourage the spread of knowledge of the principles of eugenics, and to aid the health authorities in their good work.

Further, policy holders are enjoined to submit to frequent health examinations by their family physicians with view to the early detection of incipient disease and the proper early treatment of such disease. The family physician and the policy holder are urged to keep in closer touch each with the other, for the benefit of the policy holder.

Perhaps none would claim that the circulation of the abovementioned letter was actuated by motives solely altruistic, yet the good results which may be born of its influence will be largely humanitarian as well as commercial.

The spectacle of a large commercial concern aligning itself with the health authorities of the country in their fight against preventable disease is a rare one, and is a tangible evidence of the further awakening of the public to its duty to itself and to posterity.

CLOSURE OF NAVAL STATIONS AT SAN JUAN AND CULEBRA.

The Navy Department has abandoned the naval reservations at San Juan and Culebra, P. R.

The United States naval hospital at San Juan and the sick quarters at Culebra were placed out of commission, and on June 28, 1911, they were formally transferred to the insular authorities. Under the direction of the governor of Porto Rico these buildings, with their equipment and medical supplies, will be open for the reception and treatment of the sick of Porto Rico and Culebra.

The permission was granted by the Navy Department for the benefit of the people of Porto Rico, and the agreement is revocable at the pleasure of the Secretary of the Navy. The insular authorities agree to vacate the premises within 30 days after receipt of notice so to do.

NEW PAVILION FOR THE PRACTICE OF THORACIC SURGERY.

In a paper read before the New York State Medical Society at Albany, April 18, 1911, Dr. Willy Meyer described the slow but steady march to victory of a movement which has resulted in the establishment at the German Hospital, New York City, of a new operating pavilion for the treatment of patients who require the aid of thoracic surgery.

The installation of this pavilion renders possible the practice of transpleural surgery under such varying conditions of atmospheric pressure as the individual case may be deemed to demand, and gives promise of a broad view of a great field of which we have had but fleeting glimpses.

The ability to attack with impunity intrathoracic surgical disease greatly strengthens the arm of the surgeon in his fight, and the knowledge that formerly unavailable surgical aid now may be invoked focuses upon the patient more rays from the star of hope than hitherto have helped to hurry the lagging hours of those sick of surgical diseases of the chest.

THE BELLEVUE HOSPITAL NOMENCLATURE OF DISEASES AND CONDITIONS, 1911.

Bellevue Hospital has, through its committee on clinical records, composed of Drs. Robert J. Carlisle, Warren Coleman, Thomas A. Smith, and Edmund L. Dow, rendered hospital, municipal, State, and national health officers a most valuable service in compiling a list of causes of physical disability based upon the International Classification and by applying its own unsurpassed clinical experience.

This expansion of the International Classification was drafted contemporaneously with, but independent of, the list which was prepared to meet the needs of the Navy and Army by Surg. C. N. Fiske, United States Navy, and published in the Bulletin in April, 1911.

Following the exchange of resulting manuscripts the Bellevue committee has, through correspondence, courteously cooperated by including practically every title which seemed to be required by the Government services, so that in its published form the latter may now avail themselves of a complete and authoritative list of titles for both the collection and publication of statistics of deaths, diseases, injuries, and surgical operations as soon as the necessary changes in official returns may appear practicable.

Medical departments of navies and armies have for many years been publishing morbidity as well as mortality statistics, while municipal, State, and national vital statisticians have experienced untold troubles in collecting reliable birth and death rates alone. Hospital authorities have during the past decade appreciated the need for comparing morbidity data, and it has remained for Bellevue and allied hospitals to furnish a nomenclature designed primarily therefor. This nomenclature was highly recommended to the American Medical Association at its June meeting at Los Angeles by the committee on nomenclature and classification of diseases.

Should the Bellevue Nomenclature be adopted by the Navy, its 66 small pages could readily be republished in the new "Instructions for Medical Officers" or as an addendum.

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PROGRESS IN MEDICAL SCIENCES.

GENERAL MEDICINE.

Surg. A. W. DUNBAR and Passed Asst. Surg. J. L. NEILSON, United States Navy.

BRILL, NATHAN E., A. M., M. D. **Pathological and experimental data derived from a further study of an acute infectious disease of unknown origin.** American Journal of Medical Sciences, August, 1911.

The author has observed recently a fatal case of this disease which has supplemented former clinical studies reported previously. The pathological findings show that Brill's disease has no relationship to any of the typhoid group and the establishment of its association with typhus is further removed than ever.

The disease commences rather suddenly with a chill, general body pains, and agonizing headache. Fever develops quickly, reaching its maximum on the third day, then continues 12 to 14 days at 103° to 104° F. Apathy and prostration are marked. A somewhat characteristic eruption differentiating it from most other infectious diseases appears on the fifth or sixth day.

It is fairly profuse, discrete, maculo-papular, dull red, and erythematous in character, but only partially obliterated by pressure, and is located on the trunk and limbs, rarely on palms and soles. It develops within 24 hours after initial appearance and is permanent during the illness.

After 14 days lysis occurs, headache subsides, and rapid convalescence follows. Kernig's phenomenon and rigidity of the neck rarely occur. Albuminuria and slight leucocytosis are frequent. The blood shows no agglutination with the organisms of the typhoid group and blood cultures are negative. The cases occur sporadically and are apparently not directly contagious.

A previous history of typhoid appears in 10 out of 34 cases. An examination for insect bites as a rule gave negative results.

The findings upon necropsy of a fatal case showed congestion and parenchymatous degeneration incident to an intense infection. The absence of intestinal lesions characteristic of typhoid are significant. Blood cultures were negative.

Two previous fatal cases were diagnosed by Brill as typhus, but he believes that had they come under observation earlier they would have been included as the disease under consideration.

An endeavor has been made to determine experimentally whether or not this disease is related to typhus, but up to this time inoculation of monkeys by blood taken from a patient during the fifth and sixth days of the disease and also from the fatal cases gave negative results. While the author has always maintained that this infectious disease so closely resembles typhus that occurring during an epidemic no differentiation could be made yet there are important variations between the two. Typhus fever appears in an epidemic form, while Brill's disease is sporadic; the former gives a high mortality rate, the latter a negligible one. Typhus occurs most frequently in the fall and early spring, while the other disease is most frequent in the spring.

In Brill's disease there is a marked absence of nervous symptoms as seen in typhus, and the apparent noncommunicability is another dissimilarity.

Blood inoculation as well as the low death rate differentiates it from the Mexican typhus (tabardillo), and should further experiments exclude the Old World typhus the evidence that the disease is one *sui generis* would be most conclusive, although the writer suggests that it may possibly be an attenuated form of typhus fever.—(A. W. D.)

SANDES, T. LINDSAY, M. A., M. D. **The mode of transmission of leprosy.** The Journal of Tropical Medicine and Hygiene, August 1, 1911 (No. 15, Vol. XIV).

The author first briefly discusses the various theories of the transmission of leprosy and the experiments he had performed which led him to believe that bedbugs are more intimately connected with its spread than any other insect. Having reached this conclusion he carried out a number of tests by allowing bedbugs to feed upon the lesions present in active cases and examining microscopically the contents of the probosis, stomach, and intestines and tissues for the lepra bacillus, comparing the organisms found with artificially grown bacilli. He also endeavored to infect guinea pigs, rabbits, and monkeys, and to reinfect "arrested" cases of human leprosy by the bite of the infected bugs. As the result of his work he suggests the following conclusions:

(1) That, considering the enormous numbers of the lepra bacilli in the infiltrated or ulcerated skin and nasal mucosa of an active tubercular leper, and the ingestion of bacilli by certain insects, direct contact and transmission by flies, fleas, mosquitoes, or other insects are possible modes of spread of the disease; but such infection, if it ever does take place, is accidental and exceptional.

(2) That, having found acid-fast bacilli answering as far as our imperfect tests permit to the characteristics of the lepra bacillus in a considerable proportion (about 30 per cent of specimens) of *Acanthia lectularia* (bedbug) up to 16 days after feeding upon lepers, there is

reason to believe that this species of insect constitutes a very important agent in the spread of leprosy.

As the author states, it is impossible to prove this question absolutely without biting healthy individuals with infected bugs, and this is manifestly impossible. He closes his article by the citation of two cases strongly indicating that the point of infection with the disease was the bite of a bedbug.—(J. L. N.)

VON ADELUNG, E., M. D. **Genesis of incipient tuberculosis.** Interstate Medical Journal, Vol. XVIII, No. 7.

Immediately following Koch's discovery of the tubercle bacillus the demonstration of the presence of this organism was considered essential for the diagnosis of tuberculosis. Later the gross signs of consolidation and râles were made the basis for the diagnosis in the absence of the bacillus tuberculosis, but the subsequent history of these cases showed a tardy diagnosis. Closer study of the physical signs has resulted and, at the present time, structural changes of surprisingly small extent are detected. In the detection of these early cases auscultation alone holds a high place, but even its usefulness is closely circumscribed, its value not depending solely upon râles, bronchial or harsh breathing once considered the earliest signs, but also upon still finer alterations of breath sounds so fine as to make description difficult, but may be described as follows: "The respiratory murmur is rough and low-pitched, and is made up of a succession of very short sounds as though small, soft granules of fine, wet sago were being rolled over each other;" or as described by Bonney: "The prominent auscultatory signs as a rule do not relate to changes in pitch, quality, rhythm, or intensity of the respiratory sounds, but consists of fine crackling râles heard chiefly at the end of inspiration following a cough." The Litten sign is not now regarded as of value in early diagnosis. Under favorable circumstances the fine differences in physical signs referred to above may be demonstrated, but as a rule harsh respiration or fine râles are the first signs elicited.

It frequently occurs that incipient cases do not feel sufficiently ill to consult a doctor, and also that the disease in this stage and also when moderately advanced is frequently unrecognized by the medical practitioner.

In doubtful cases a radiograph should be required, and the author states "that in the presence of unexplained constitutional symptoms, such as marked loss of weight, weakness, reduced endurance, or continual impairment of appetite, one should never deny the presence of thoracic tuberculosis unless a negative radiogram has been obtained."

But even this refinement of diagnosis does not reach the ultimate goal. The detection of "prepulmonary" tuberculosis is of especial importance in children.

Early detection of mediastinal or peribronchial infection is difficult, reliance being placed upon tenderness over the upper thoracic spines (Petruschky's sign), combined with local dullness or, in more advanced cases, with pressure symptoms. In all cases the radiogram is of increasing value, as its technique and interpretation is better understood. When these methods yield a positive result, which is confirmed by the tuberculin test and constitutional symptoms, the diagnosis of "prepulmonary" tuberculosis is possible.

It is thus seen that the modern conception of incipiency has advanced from "prebacillary" to "prepulmonary" recognition.—(A. W. D.)

M. A. Cassidy, M. D., and C. M. Page, M. S. **A method for determining the absolute pressure of the cerebrospinal fluid.** Proceedings of the Royal Society of Medicine, January, 1911.

These two observers have noted the great variation in the accepted *normals* for inthrathecal pressure and conclude that they are the result of the use of different types of apparatus and to a neglect of the factors which normally influence cerebrospinal pressure, namely, gravity and venous back pressure. They have developed a method which will yield uniform and comparable results.

The apparatus consists of a hollow needle of 1.5 millimeters bore provided with a close-fitting stylet. Two centimeters from the blunt end of the needle is a simple cock. Beyond this cock is fitted a tapped nozzle connected to an open glass tube (18 centimeters in length and 15 millimeters in diameter) by a meter's length of pressure tubing. A wooden clip to which is attached a measuring tape can be fixed to any point of the glass tube.

To use this appliance, the patient is placed on the side with the lumbar spine flexed and the cerebrospinal axis in an exactly horizontal position. After the proper precautions for asepsis, normal saline at 120° F. is poured into the tubing and the tap on the nozzle is closed when the glass tube is half full. The wooden clip with measuring tape is now attached at the level of the fluid in the glass tube. The needle is introduced into the theca, stylet withdrawn, and the cock is closed as soon as the spinal fluid appears at the orifice of the needle. The pressure tubing is then connected by means of the nozzle. Both taps (that on the needle and that on the nozzle) are now opened and the column of saline solution balanced against the cerebrospinal pressure. The glass tube is quickly lowered or raised to keep the contained solution at its original level. The vertical

height of the clip above the needle will then give the intrathecal pressure in the terms of normal saline solution.

If the proper connection has been made between the spinal fluid and the saline solution there will be a rise and fall of pressure to the extent of 1 centimeter synchronous with the respiratory movements. If this fluctuation is not present the reading will be valueless. There should not be more than one or two drops of the spinal fluid escape in making the connection between needle and nozzle.—(J. L. N.)

GOODHART, J. F. **The after history of cases of albuminuria occurring in adolescence.** Proceedings of the Royal Medical Society, June, 1911.

The author leads up to the subject of the paper by a brief discussion of the original condition in youth known variously as cyclic, intermittent, postural, functional, etc., albuminuria.

He believes that "cyclic" is the term to use, as all natural functions are cyclic, including micturition, and that this function is most active in the mid-morning hours, at which time the characteristics of the urine in most people depart from the usual (less acid, phosphates, and urates appear and even sugar), and it is at this time also that the functional albuminuria is found if it is present. When found, it is serum albumin in nearly all cases.

As to cause, he feels sure that posture alone is not responsible for the condition, but that it is due to some digestive fault. As possible causes, he mentions rapid and inordinate growth, food bolting and the secretion of the prostate, which is heavily laden with albumin during early sexual development, owing to the turgid condition of the organ.

He feels safe in his diagnosis, if he has examined the urine three or four times on each of two or three consecutive days, and has found that the albumin varies from none in the morning, through more about 11 a. m., to less again at 5 p. m., and bedtime. Casts should be carefully looked for at each examination and should be absent.

In all cases that he has followed (some as long as 30 years) not one developed persistent albuminuria or kidney disease, and in his opinion the albuminuria of adolescence has no sinister effect upon health or upon the duration of life, and with due circumspection such cases ought not to be excluded from the advantages of life insurance or Government appointments.

In the discussion which followed the reading of this paper, Dr. Saunby emphasized the postural element, citing cases in which the albumin was found to be greatest in quantity soon after breakfast when the patient arose at the usual time, but greatest in quantity in the afternoon when the patient remained in bed until midday.

Dr. H. G. Armstrong classed these cases as athletic, emotional, functional, and lordotic. In the athletic form he was satisfied that the condition results from lowered blood pressure. He has seen many cases of temporary albuminuria resulting from fright. It was his opinion that the true type of adolescent albuminuria is the functional, that this results from a definite cardio-vascular neurosis, and that heredity plays an active part, in that one or both parents are usually of a neurotic type. The lordotic type was associated with marked lumbar lordosis, which caused pressure on the renal veins and gave rise to the most persistent form of adolescent albuminuria.

Dr. Clement Dukes stated that in no case of this form of albuminuria which had grown to man's estate had he found the albuminuria still persisting.

The general consensus of opinion was in support of the author's statement that this condition is an unimportant one, as regards the duration of life. However, Dr. Samuel West stated that the statistics of insurance offices show distinctly that among those cases accepted with albuminuria (without evidence of kidney disease, of course) the mortality rate is higher than among those without albuminuria. He believes the significance of this condition is greater after the age of 25 years and increases in gravity with each year thereafter.—(J. L. N.)

DUNHAM, H. K.; BOARDMAN, W. W.; WOLMAN, S. **The stereoscopic X-ray examination of the chest with especial reference to the diagnosis of pulmonary tuberculosis.** Bulletin of the Johns Hopkins Hospital. Special Tuberculosis Number, July, 1911.

During the past year or two considerable progress has been made in the early diagnosis of pulmonary tuberculosis by the employment of X rays together with the other more or less well-tried-out methods of examination; and the workers who have used radiograms in diagnosis of lesions within the chest have come to feel, although not unanimous as to the degree, that the method has a settled and definite value in the recognition of the comparatively early lesions of pulmonary tuberculosis.

The writers of these three papers seem to have taken a step in advance of other workers in this country. Their conclusions are based altogether on the evidence presented by stereoscopic radiograms, holding that the advantages of the stereoscopic plates must be self-evident as the chest is seen in perspective, the shadows occupying the same relative position in the image as the structures which cast these shadows occupy in the chest; whereas on the single plate, of necessity, various shadows are superimposed one upon the other.

A series of cases, controlled by careful clinical examination and ordinary laboratory methods, was studied in the X-ray laboratory

of the Phipps Dispensary. This work was supplemented, first, by stereoscopic plates taken shortly after death, careful comparison with autopsy findings following; second, studies of stereoscopic X-ray plates of animal and human beings in which blood vessels and bronchi had been injected with bismuth or other similar materials; and, third, studies of stereoscopic X-ray plates of the lungs of animals and human beings upon which more or less dissection had been done.

The papers call attention to the principles and technique of stereoscopic X-ray examinations, describe the alterations in the normal chest shadows which the authors believe to be characteristic of pulmonary tuberculosis, and give the evidence which undoubtedly proves that the shadow seen at the hilum in X-ray plates of normal chests is caused by the primary branches of the pulmonary vessels with their contained blood and by the walls of the primary branches of the bronchi, together with the lymphatics, glands, and fibrous tissue which accompany these structures and bind them together. "The blood vessels probably account for a greater part of the hilus shadow than do the two parallel shadows cast by the branches of the bronchi. The shadows seen in the lung fields are also due to the blood vessels with their contained blood and to the walls of the bronchi." "The surrounding fibrous and lymphatic tissue is normally so slight that it probably plays little part in the production of these shadows." However, all the factors take part in the casting of the shadows.

In their technique the average working distance is 25 inches. Between the first and second exposures the target of the tube is moved a distance of 6 centimeters in a plane parallel to the X-ray plate so that the focal distance is equal in both exposures. The target is moved in a line parallel to rather than across the spine of the patient, as this stereoscopic view allows one to see around the ribs, thus obstructing less the view of the lung fields. The total time required for the two exposures, including the movement of the tube and the changing of plates, must not exceed a period of easily sustained inspiration, a time well under 10 seconds.

The stereo-roentgenograph of the normal thorax is described in detail. "One sees the shadow picture of the bony framework with its covering of soft parts inclosing the chest cavity, except below, where it is bounded by the shadow of the diaphragm." The shadows within the chest cavity, seen in their normal relations, are readily divided into three main groups: First, the "heavy central shadow," cast by the vertebræ, heart, aorta, and other large blood vessels, trachea, œsophagus, lymphatics, and connective tissue; second, the "hilus shadow"; and, third, the "linear markings" seen in the lung fields.

Normally the hilus shadow is of small extent, merging internally with the heavy central shadow. Externally it radiates irregularly

to a distance of 4 or 5 centimeters on either side of the fifth, sixth, and seventh dorsal vertebræ. It has a sharp border made irregular by the heavy trunks emerging from it into the lung fields, three on the right side and two on the left, marking divisions which roughly correspond to the lobes of the lungs. Distally the heavy trunks divide and subdivide producing the radiating shadows which appear as fairly definite straight lines and are designated as fine linear markings. On normal plates they are lost before they reach the periphery of the lung. With advancing age there is an increase in the density of all these shadows. The shadow seen along the right side of the vertebral shadow, extending from the clavicle to the base of the heart, was found to be cast by the superior vena cava, contained blood, lymphatics, and fibrous tissue.

On plates made from chests in which early but definite signs of pulmonary tuberculosis are found on physical examination, the hilus shadow shows usually an increase in area and density, due to a general increase in the fibrous and lymphatic tissue accompanying local or general mediastenitis. There may be small irregular shadows of great density caused by calcified caseous or fibrous glands. Infections other than tuberculosis may cause such mediastinal changes. Calcified glands point to an old tuberculous process, more or less healed.

The heavy trunks extending toward the involved area appear broader, denser, and less regular in outline than in the normal. In the diseased area the fine linear markings appear broader, denser and less regular in outline. Frequently their course is studded, the lines sometimes being almost obliterated, and they can no longer be traced as radiating, but are broken in continuity and reach to or near the periphery. The lines appear to cross and interweave, producing a network of various-sized mesh. There may be slight changes or none in uninvolved areas of the lung. It is believed that these changes collectively constitute a shadow picture characteristic of early pulmonary tuberculosis.

"As the lesion progresses the alterations become more marked. The linear markings are more and more broken up and irregular. The studdings become larger and denser, and the interweaving closer until eventually the whole area appears as a more or less homogeneous shadow of increased density, due to the presence of gross areas of consolidation within the lung."

The cases studied were divided into five groups: (1) Normal; (2) diseased but not tuberculosis; (3) probably tuberculosis; (4) definitely tuberculosis; (5) healed tuberculosis. The moderately

vanced and advanced cases were readily recognized. "In the probably tuberculous cases some of the characteristic alterations are seen, but the picture is not complete. There may be changes in the shadows cast by the hilus and heavy trunks and suggestive alterations in the linear markings, or some other atypical alterations." Dense linear markings, heavily studded and sharply defined in a limited area, suggest a healed lesion. It is clearly stated, however, that the stereoscopic radiogram does not differentiate the various groups any more than does the clinical examination. The history, symptoms, and physical examination are essential in doubtful cases, but in every case the pulmonary disturbance, as judged by the interweaving, was more extensive than the lesion as judged by clinical means. "Even a slight apical lesion appears as a long track from the root." It is concluded that the X ray does not differentiate active from healed lesions. However, neither do physical signs.

Pleurisy is almost constant in pulmonary tuberculosis and is liable to be overlooked both clinically and radiographically. "Marked localized thickenings and interlobular pleurisies are recognizable, but the evenly distributed pleurisy which spreads uniformly over one or both pleural surfaces usually defies detection." Pleurisy with effusion is readily detected. The line of contact between the shadow of the fluid and the shadow of the lung forms a series of cuplike depressions.

In the study of 92 cases of definite or suspected pulmonary tuberculosis the radiographic findings and the clinical findings, independently obtained, were entirely harmonious in all but 7 cases. "However, in 6 of these 7 the disagreement was only partial and comparatively slight, so that in only 1 of the 92 cases was there a definite clash." This one was the case of a child of 3 years, showing a positive skin test, but otherwise negative clinical examination. The X ray showed a small lesion in the left lung.

Although diagnosis by stereoscopic radiograms of the chest is still largely empirical and controlled only by careful clinical examinations, the authors are firmly convinced that the method has great worth, and that its more general adoption would greatly increase the value and accuracy of the radiographic diagnosis of pulmonary conditions. The conclusion is that the stereograph has the ability "to discover abnormalities and to diagnose them; and although in the great bulk of cases it tells us no more than a careful clinical examination, yet in a fair number of cases, and these among the most interesting and puzzling, it gives additional information."—PASSED ASST. SURG. J. R. PHELPS.

BOARDMAN, W. W., M. D. **The use of antiformin in the examination for the tubercle bacillus.** Bulletin, Johns Hopkins Hospital, Special Tuberculosis Number, July, 1911.

Reports from tuberculosis dispensaries and sanitaria indicate that 8 to 46 per cent of cases diagnosed as tuberculosis show no tubercle bacilli in sputum.

This is due: (1) No bacilli in sputum; or (2) imperfect methods of examining for bacilli.

The author reviews methods of concentration by sodium hydroxide and acetic acid, etc.; and of using antiformin, and states the method found most satisfactory, as follows:

1. Place entire 24 hours sputum in conical glass; if excessive amount, use only 15–20 cubic centimeters.
2. If specimen is thick, add an equal volume of distilled water (make sure water is free from acid fast bacilli). Less tenacious sputum does not require so much dilution.
3. Add amount of antiformin equal to one-fourth volume of diluted sputum, sufficient to make 20 per cent solution of antiformin.
4. Stir thoroughly to break up masses and hasten complete solution.
5. Allow to stand until solution is homogeneous. It should be watery in consistency and pale yellow in color. Add more water or antiformin, if necessary. Solution is usually complete in from a few minutes to an hour, but may be allowed to continue for days with no resulting harm to tubercle bacilli.
6. Add an equal volume of 95 per cent alcohol to reduce specific gravity, to hasten and make more complete the sedimentation.
7. Stir well and allow to stand until sedimentation is complete. It will occur in two to four hours, but a 12 to 24 hour period is recommended. It may be necessary to gently turn the vessel to dislodge particles of sediment adhering to the sides of the vessel.
8. Pour off clear supernatant fluid.
9. Make smear from sediment, using some of original sputum to aid in fixing the smear. This is best done by making a smear from the sputum before adding antiformin and afterwards spreading sediment from the sputum-antiformin mixture on the same slide.

Stain and examine in the usual way.

He examined sputum as follows:

(*a*) 73 cases, clinically definite tuberculosis.

(*b*) 6 cases, probably tuberculosis.

(*c*) 16 cases, doubtfully tuberculosis.

(*d*) 8 cases, definitely nontuberculous.

By smear methods, groups (*b*), (*c*), and (*d*), 30 in number, were negative. Of group (*a*), 31 showed tubercle bacilli.

By antiformin method groups (*b*), (*c*), and (*d*) showed no tubercle bacilli. Group (*a*), the 31 positive by smear, showed enriching in the proportion of 25 to 138, that being the number of bacilli counted on the respective slides in a period of two minutes, and of the remaining 42 cases of group (*a*), showing no tubercle bacilli by the smear method, 7, or 16.6 per cent, showed tubercle bacilli by the antiformin method.—ASST. SURG. G. F. CLARK.

SURGERY.

Surgs. RAYMOND SPEAR and EDGAR THOMPSON, United States Navy.

CUSHING, HARVEY. **The control of bleeding in operations for brain tumors.** Annals of Surgery, July, 1911.

In this article many points are brought out in the operative technique of brain surgery that have enabled Cushing to deal successfully with the many perplexing surgical problems that continually occur during the work of a brain surgeon.

The elimination of pain has rendered haste unnecessary. Detailed blood-stilling, delicacy in the handling of tissues and accurate coaptation of divided parts are important factors in the ultimate success of brain operations.

Two vascular systems, internal and external, are to be considered. On the arterial or carotid side these systems are quite distinct, but on the venous side communications are so free that when intracranial tension is increased by the presence of growths the venous return is shunted into the extracranial field.

For controlling hemorrhage from the scalp a properly applied tourniquet furnishes the most satisfactory means. This controls the arterial supply, and if there is no cyanosis from the anaesthetic, or no widening of the emissary veins it may be sufficient.. Clamps are, however, necessary if bleeding continues. It is best to catch the galea and allow the weight of the clamp to control a bleeding point in the scalp proper. This procedure prevents necrosis of the skin from pressure.

In closing scalp wounds Cushing brings the edges of the galea together by means of a series of fine interrupted iron dyed silk sutures. The skin edges are brought together by means of fine cambric needles and the same silk. These sutures are removed on the fourth or fifth day.

All grades of vascularity may be encountered in the skull. Chief reliance for control of bleeding must be placed on the proper use of Horsley's bone wax. At times the exposed skull may be so vascular and roughened that it must be rubbed with wax to check the general oozing from countless points. Free bleeding is due to separation of the meningeal emissaries, especially if the incision is carried into an area of newly formed arachnoidal villi with a distribution beyond the usual confines of the Pacchionian granulations. It is always advisable to give the longitudinal sinus and its emissaries a wide berth. If the foot area is to be exposed it is better to turn down a flap and then expose the area by cutting out a section of bone from the upper edge.

Cushing prefers hand-driven instruments to those worked by electric motors. After making the preliminary and secondary trephine openings with the perforator and burr, Cushing passes a dural sepa-

rator between the two and breaks up the vascular attachments, for their bleeding has usually ceased when the bone is cut through.

For control of hemorrhage from the dura the following adjuncts have been found useful: (1) Small pledgets or "tips" of gauze of various sizes secured by a black ligature, so that if blood stained they can be easily located. (2) Sterile absorbent cotton used dry or wet in a saline solution 100° to 105° F., the solution being kept in a bowl. This dripping cotton is the best material for washing meningeal surfaces, and when wrung out into flat pads is the most effective substance for sponging and placement in deep cerebral wounds. (3) Bits of living tissue, small pieces of the exposed temporal muscle serve admirably, as a means for checking venous extravasation from points in the dura, and fragments of partially organized blood clots, obtainable at a second-stage operation, are also useful. (4) Silver wire "clips" for placement on inaccessible vessels too delicate or in a position too awkward for safe ligation.

Postoperative vomiting or straining may dislodge small terminal thrombi. For this reason patients are sometimes allowed to recover from the anæsthetic on the well-padded operating table. Serious cases are frequently kept in an adjoining recovery room over night and then removed to the ward.

In a case of cerebellopontine tumor a troublesome hemorrhage from the side of the pons was controlled by a small piece of the dura which was cut off and plastered over the bleeding point. Cushing carefully preserves all organized blood clots in second stage procedures by means of saline gauze for application to bleeding areas. The walls of blood vessels possess active clotting elements, and so it has been suggested that the walls of preserved vessels might be used, and also fibrin from whipped blood.

The control of hemorrhage from the brain tissue itself is most important. All rough measures, mass ligatures, and mass gauze packings should not be countenanced. Familiarity with the tricks of lessening tension in dealing with dry and wet brains by preliminary decompression, by pricking arachnoid spaces by ventricular or lumbar punctures, and by change of posture of the patient, is important. The whole matter hinges on the disturbance of the cerebrospinal circulation and not on the size of the tumor. Large growths may easily be extirpated where there is no increase in tension, and, on the other hand, the removal of a small growth where there is cyanosis and increased tension is fraught with much danger unless the brain tension is diminished.

Shock in Cushing's experience is rare in brain operations if there has been no hemorrhage or injury to some vital center. The tearing out of a growth by the insertion of the fingers means fragmental removal, extravasation, and œdema from unnecessary damage, and

blind points of hemorrhage. On the other hand, it is astonishing how dry the subcortex may actually be if care is taken with the superficial vessels. A safe point of entry can usually be found. A slow separation of the tumor from the brain substance, working slowly here and now there, and leaving small flattened pads of hot wrung-out cotton to control the oozing, is best.

Control of the superficial vessels can be accomplished by fine silk ligatures passed by means of fine curved needles under the arteries. Great care should be taken not to ligate the venæ anastomoticæ or important branches of the middle cerebral, lest areas of softening result.

The oozing from the raw surface of a large hole in the cortical substance can be controlled by filling the hole with dry absorbent cotton, replacing it when it becomes saturated. Ultimately the cavity can be filled with normal salt solution and the dura closed over it without drainage. Cushing rarely uses drains.

The use of small U-shaped silver clips in the control of hemorrhage has been very satisfactory in Cushing's hands and has enabled him to control deep and inaccessible bleeding points quickly and effectually. The clips are made by simply cutting the silver wire after it has been tightly wrapped on a flat metal pencil which has been grooved longitudinally. The wire is tapped after it is wound in order to receive indentations to prevent slipping. The clips are applied by means of a clamp grooved to receive them, and is so constructed that it locks after picking up the clip and unlocks when the clip is applied.—(R. S.)

SIDORENKO, DR. A. T. **Intravenous anæsthesia from hedonal. A report from the surgical division of the marine hospital, Cronstadt, Russia.** Zentralblatt für Chirurgie, 1910, No. 37.

In view of the many undesirable features of inhalation narcosis, new substances or combinations are always a theme for discussion and suggestion.

Recently the attention of surgeons has been directed by Prof. Feodorow (Zentralblatt für Chirurgie, 1910, Nos. 9 and 10) to the narcosis on human beings produced by intravenous injection of hedonal.

In our hospital practice we have used hedonal narcosis on 60 cases. The solution is 0.75 per cent strength in physiological salt solution, and kept in a graduated bottle maintained at a constant temperature of 104° F. The solution usually flows from a height of 60 to 70 centimeters, but in the cases of children and old people it should be lower.

The solution is given in the median basilic or cephalic vein. After dissecting out the vein the peripheral end is tied, and an opening is

snipped with scissors in the course of the central end of the vein through which the canula is introduced. Narcosis occurs after the infusion of from 300 to 500 or 700 cubic centimeters. Debilitated patients require less quantity, but alcoholics should have more. After narcosis is complete the canula is removed and placed in a test tube and the vein covered with a compress moistened with salt solution, and oozing controlled by gentle pressure. In case of reappearance of the reflexes, the infusion may be repeated through the same opening in the vein, after the cold solution in the tube has been run out and blood clots in the opening of the vein have been removed by light massage from the center toward periphery. The quantity of liquid used in the second infusion may be one-half or one-third the previous amount. In successive infusions the amount is correspondingly diminished. After the operation the central end of the vein is ligated, and the skin wound closed with two or three stitches.

In the 60 cases narcotized in this manner the impression was excellent. Narcosis always ensued without complication in spite of the fact that the cases were decidedly different, and the results were as agreeable in a 6-year-old child as they were in a man of 70 suffering with myocarditis, arrhythmia, and pronounced arteriosclerosis.

The narcosis appears without the stage of excitement, and only alcoholics and very strong persons make some movements of the extremities before sleep. Vomiting has not been observed either during or after operation.

If, through mistake, the rapidity of the flow has been raised to 100 cubic centimeters per minute, not rarely cyanosis, dropping backward of the tongue, and temporary cessation of respiration have been observed. Apparently the hedonal influences the center for respiration. On the other hand, when the rapidity of the flow was 50 to 60 cubic centimeters per minute these symptoms were not observed. Besides, this cessation of breathing has no dangerous significance, as breathing is soon resumed of itself or after a rhythmical compression of the chest.

The pulse is usually quickened. The blood pressure, taken with the Riva-Rocci apparatus, sinks at first a little, but soon recovers.

After the operation the patient may have some shivering, followed by sweating, a phenomenon observed after infusion of salt solution in typhus and cholera. After the introduction of considerable amounts of hedonal (7 to 10 grams) some cases are attacked with periodical excitement, which may be controlled with morphine.

During the period of persistent sleep after operation the tongue will show a tendency to drop back.

Not a single case of thrombus formation was observed in our series of 60 cases, and in only 2 cases occurred hardening in the course of the median basilic vein from 3 to 6 centimeters long.

In some cases the daily quantity of urine secreted was increased, but no albumen was ever found.

RÉSUMÉ.

1. In using the hedonal solution (0.75 per cent) we do not use the Sahli apparatus, but have prepared a siphon which has a canula attached and is introduced not in the peripheral but in the central direction of the vein.

2. To avoid complications, the most favorable rate of flow is to be about 50 to 60 cubic centimeters per minute.

3. The patient must be observed carefully after operation, as he may work himself into excitement (when morphine may be given), or the tongue may fall back.

4. In operations of short duration, which only require one infusion of solution, the operator may narcotize the patient himself.

5. Not a single case of embolism was found on section.—SURG. J. T. KENNEDY.

CABOT, HUGH. **The difficulties and limitations of diagnosis in advanced cases of renal tuberculosis.** Boston Medical and Surgical Journal, May 4, 1911.

With the new methods of examination it is possible to lay down facts with regard to the condition in the urinary tract before operation with almost absolute accuracy.

The most important result of 10 years' work has been the proof that renal tuberculosis, in its earlier stages, is almost invariably unilateral, except in the cases of diffuse miliary type. This knowledge has come as a result of the use of the cystoscope, ureteral catheter, functional tests of the renal activity, bacteriological examination, and, finally, demonstration of the facts at operation. We have now come to insist on a complete knowledge of one sound kidney, as well as the diseased one, before operation.

There are two types of genito-urinary tuberculosis in which error is difficult to avoid.

First. Cases occurring in the male with undoubted tuberculosis of the genital tract, primary in the epididymis or prostate, with bladder involvment. Determination of the kidney condition is often difficult.

Second. Cases occurring in females in which the disease is primary in the Fallopian tubes with bladder involvment obscuring the renal condition.

In difficult cases with contracted and infected bladders an accurate diagnosis depends almost completely on the ability to catheterize both ureters; this at times is difficult and hazardous.

The next step is to determine whether the case belongs to the so-called upper or lower type; in other words, whether the tubercu-

losis is primarily genital or urinary. Careful physical examination sometimes throws light on this point.

The outlook without operation in renal tuberculosis is a horrible existence, full of suffering, unless surgery offers some relief. Medicine will afford none.

Assuming that the primary focus of infection is renal and the involvement of the bladder and at times the prostate is secondary, what has surgery to offer? First, if one kidney is sound, the outlook may be fair and considerable improvement extremely probable. We know that lesions of the bladder and even of the prostate improve markedly after removal of the primary focus. We know that still further improvement may be brought about by the wise, cautious, and systematic use of tuberculin. The author believes that in many cases still further improvement may be obtained by the use of the autogenous vaccines of the colon bacillus which is a common successor of the tubercle bacillus.

Second, operative and post-mortem records have shown that even in severe and advanced cases there is a large possibility that one kidney is thoroughly sound.

The general condition of the patient is of much importance in estimating the resistance. The absence of lesions in the lungs and evidence of healed lesions shows the body is resistant to infection.

The data obtained from the study of the urinary tract is of great importance. It is important to study the 24-hour amount of urine, the total solids, and ability of the remaining kidney tissue, whether one or both sides, to respond to the stimulation of artificial polyuria.

These experiments are of particular value if it can be demonstrated that one kidney is doing the bulk of the work.

Cabot advises the use of spinal anæsthesia in difficult cases in which it is necessary to catheterize both ureters.

By cystoscopic examinations the general condition of the bladder wall can be determined and the ureteral orifices can be studied. The excretion of indigo carmine is of importance. When it is excreted promptly and in good amount from one side and little or not at all from the other, the evidence is strong that there is one good kidney.

Radiographic studies are of value in completing the picture.

In cases that belong in the doubtful class where the indigo carmine may be excreted from both sides, neither showing much advantage over the other, exploratory operation is advised, and where the kidney lesions are not clear it is better, in Cabot's judgment, to explore and get the facts.

Any exploration to be efficient must be bilateral. Cabot prefers exploring through the anterior muscle-splitting operation. Spinal anæsthesia, while best suited for preliminary work, is not the anæsthesia to use when a nephrectomy is to be performed.—(R. S.)

TURCK, R. C. **The treatment of X-ray ulcer.** Annals of Surgery, January, 1911.

X-ray ulcer can not be classed pathologically as true ulcer. The lesion is complex and partakes of the characteristics of a tissue necrosis, a gangrene, and a fibrosis.

The pain from an X-ray burn is characteristic. It is excruciating, and it will last ordinarily as long as the gangrenous tissue is in the ulcer, and stop upon its removal.

The writer reports the following case: A white male, 36 years old, with a history of syphilis contracted in 1908, followed by an attack of acute catarrhal appendicitis in December of that year. In February, 1909, he prevailed upon an experienced X-ray operator to give him, reluctantly, three five-minute exposures per week for four weeks with tube 14 inches above right iliac region; registered penetration No. 6. After an interval of a week three more four-minute exposures were given. Two weeks afterwards erythema appeared, followed by dermatitis and necrosis.

He applied for treatment in this condition in April, 1909, suffering such intense pains as to require one and one-half grains of morphine daily. At first a curettage was done, but no tendency to repair following, on April 29, under ether anæsthesia, the edges of the ulcer were thoroughly curetted and the firm leathery base of the ulcer was cut away, down to normal bleeding tissue. The fibrous base was three-fourths inch thick and bands and projections of the same extended down into the muscles and between the fasciæ. Hemorrhage was controlled with hot saline packs. The wound was thickly dusted with aristol. On the second day a wet boric dressing was applied and continued until, on May 6, the healthy granulating surface was skin-grafted. Healing progressed satisfactorily to completion. There was never any pain after the operation of removing thoroughly the fibrous base of the ulcer.—SURG. J. F. LEYS.

LILIENTHAL, HOWARD, M. D. **Nephroureterectomy.** Annals of Surgery, April, 1911.

The disposition of the ureter after nephrectomy does not yet seem to be based on any definite or radical principle. The author states that, even when the ureter is infected, there is an unwillingness to remove it radically and entirely. The usual method has been to treat the stump by ligation and disinfection. When the ureter is badly infected it has been sutured to the external wound for subsequent drainage. In a few cases where complete extirpation was necessary, it has been done through a gigantic incision over the entire course of the ureter from the last rib to the anterior superior spine and then on above and parallel to Poupart's ligament to the rectus muscle.

The author is convinced of the necessity of complete removal of the ureter in pus cases and especially in tuberculous infections. He mentions the number of cases of lumbar sinuses, abscesses, and retrovesical suppuration following an incomplete operation, also cases of tubercular cystitis have been seen where a short diseased stump of the ureter has been left; the condition being the same, in fact, as before nephrectomy.

The author recommends the following procedure after nephrectomy by any usual method. The ureter is cut between ligatures or forceps and the stump cauterized with pure phenol.

The ureter is now drawn out of the wound if possible, or it is isolated by gauze, and the forceps or ligature having been removed, a good-sized flexible urethral bougie with conical or olive point is passed down toward the bladder. A ligature is tied tightly around the ureter and instrument, so as to hold the bougie in place and prevent the leakage of infected fluids from the canal. The greater part of the lumbar wound may now be closed with drainage in the usual manner, and the patient is turned on his back. An oblique incision of from 1½ to 3 inches in length, according to the adiposity of the individual or the thickness of his abdominal wall, is made about an inch to the median side of the anterior superior iliac spine. This is carried rapidly through the abdominal muscles to the peritoneum, and then the gloved finger can easily work its way extraperitoneally down to the ureter, which will be invariably and instantly recognized because of the characteristic feel of the instrument within its lumen.

The ureter can be easily separated and drawn out, with the contained catheter, and then followed down to the bladder, ligated, cut, and cauterized.

If there is infection, perfect drainage must be maintained with the precaution not to allow any rubber tube to remain too long, as the pressure may ulcerate the great iliac vessels.—(E. T.)

HYGIENE AND SANITATION.

Medical Director H. G. BEYER and Surg. C. N. FISKE, United States Navy.

NASMITH, G. G., M. A., Ph. D., and GRAHAM, R. R., M. B. **A simple method of purifying almost any infected water for drinking purposes.** Jour. Roy. Army Med. Corps, Vol. XVII, No. 1, July, 1911.

From bacterial counts of raw, artificially infected (*B. typhosus* and *B. coli*), and chlorinated waters from the Province and Lake of Ontario the authors offer the following certain method for rendering polluted water safe:

(1) Take a teaspoonful of chloride of lime, containing about one-third available chlorine, and remove the excess of powder by rolling a pencil or other round object along the top of the spoon, or by flattening it with a penknife blade, so that the excess will be squeezed off.

(2) Dissolve the teaspoonful of chloride of lime in a cupful of water, making sure that all lumps are broken up, and to it, in any convenient receptacle, add 3 or 4 cupfuls of water.

(3) Stir up the mixture, allow to stand for a few seconds in order to let any particles settle (this stock solution if kept in a tightly stoppered bottle may be used for four or five days), and add 1 teaspoonful of this milky stock solution to 2 gallons of the water to be purified in a pail or other receptacle. Stir thoroughly in order that the weak chlorine solution will come in contact with all of the bacteria, and allow to stand for 10 minutes. This will give approximately one-half part of free chlorine to a million parts of water, and will effectually destroy all typhoid and colon bacilli, or other dysentery-producing bacilli in the water. The water will be without taste or odor, and the trace of free chlorine added rapidly disappears.

Freshly manufactured chloride of lime should contain about one-third available chlorine, but rapidly deteriorates if exposed to air or if kept in cardboard containers instead of glass or zinc. In case the lime is believed to have deteriorated, 50 per cent more of the stock solution should be used. Thorough mixing is essential, as is also freedom from lumps of organic matter, mud, or salt. The presence of hydrogen sulphide requires larger quantities of chlorine solution. While 0.3 parts of chlorine per million is sufficient for purification, the 0.5 parts obtained in the above procedure give a certain margin of safety and neither taste nor odor can be detected.—(C. N. F.)

MELVILLE, C. H., R. A. M. C. **The physiology of the march.** Jour. R. A. M. C., Vol. XVII, No. 1, July, 1911.

In his eminently lucid and practical lecture at the Staff College, Lieut. Col. Melville makes breakdown on the march synonymous with the undue accumulation of heat in the body resulting in heat stroke. Muscular contraction is necessarily accompanied by the production of heat which under purely physiological conditions causes an average rise of 2.3° F. above normal body temperature and which calls for dissipation through quickened circulation of blood in body surfaces so that breathing, convection, and especially evaporation of perspiration can cool the body. A normal exercise temperature of 101.6° F. reduces the margin of safety of 4.5° to 1.4°, 100° F. being considered the physiological limit or danger signal.

The chief impediments to heat dissipation in marching are the unvarying clothing and load and improper methods of wearing them, uneconomical pace for the individual, humidity, particularly in the rear of a column, and the scarcity of drinking water.

The wearing of a jacket was found to increase the body temperature 50 per cent more than not wearing one on the march, a tax equivalent to carrying a load of 30 pounds on a cold day. The entire load should probably not exceed one-third of the body weight and should be supported as nearly as possible to the center of gravity of the body (a little below the navel). The chest should be free from straps and the coat capable of being worn open with lapels buttoned back and sleeves rolled up; there must be no constriction about the neck.

A five to ten minute halt about every hour but not at too rigid intervals is required while the men should remove equipment and lie down.

Drinking water is necessary both on and after the march to relieve the "thirst of necessity," although the thirst of habit should be controlled; this to replace heavy loss through perspiration which as loss of body weight may be 4 or 5 pounds in 7 miles of marching order with load. Good food and favorable weather are desiderata not always obtainable.—(C. N. F.)

Wall paper and illumination. British Medical Journal, April 29, 1911.

Editorial outline of papers by Haydn Harrison and P. J. Waldram before the Illuminating Engineering Society is of interest as tending to confirm the impression, which is generally gaining acceptance among naval hygienists, namely, that the officially adopted light-green tint for interior living compartments of ships is best adapted for the control of the retinal shock and visual fatigue attending inadequate general illumination or high local luminosity.

White wall paper, said to be commonly used in the United States from motives of economy in lighting, has "a peculiar and unfortunate psychological rather than physiological" effect. Even dark-colored surroundings might be preferable to white, the glare of which causes continuous papillary contraction.

In the discussion V. H. Mackinney described tests carried out with various colored walls, white ceiling, and lamp without reflector; no figures to indicate foot candles are quoted.

With a dark-green paper more than double the illuminating energy was required in order to obtain the same flux of light on the working plane—that is, the table plane—as in the case of a white-walled room.

With red paper the demand for compensatory lighting was scarcely less than in the case of dark green, but with light green the necessary increase was only about 40 per cent. In some similar experiments conducted by Mr. Haydn Harrison, dark green was found to have the lowest reflecting value of the colors chosen, while light green was at the other end of the scale, and intermediately, in the order given, were dull cardinal red, medium blue, bright red, and light blue, this last, however, being considerably behind light green. Mr. P. J. Waldram, who also read a paper on the subject, pointed out the foolishness of buying light in order to feed the rapacious appetite of dark-red and olive-green papers. He contended that it was not wise to consider the working-plane illumination as a criterion of the illumination of the whole room. Everyone unconsciously judged a room by its walls, and the light reflected by the walls and ceilings had a psychological effect upon those who used it, which neither the lighting expert nor the architect could afford to disregard.

The increase of flux of illumination on walls by reflection tended to vary from between 50 and 70 per cent, with white wall paper, down to between 20 and 30 per cent, with very dark papers.

In the discussion general opinion favored light green for most purposes.—(C. N. F.)

LUSTIG, Prof. **Vaccination et serotherapie anticholeriques.** Bulletin Mensuel, Office International d'Hygiène Publique. Tome III, No. 6, June, 1911.

In his note transmitted by the Italian delegate, Prof. Santoliquido, Lustig holds out great hopes for the subcutaneous injection of the nucleoproteids extracted from cholera vibrios on account of their manifest antigenic properties for prophylaxis; bacteriolytic action far exceeds in importance their agglutinating powers. Too little is yet known of the cholera toxin and its specific action to justify expectations for the early production of a successful anticholera serum while the intoxication is usually of such a fulminating and overwhelming character as to preclude opportune serotherapy.—(C. N. F.)

WALKER, C., B. Sc., M. B., Ch. B. **Upon the inoculation of materia morbi through the human skin by flea-bites.** Journal of Hygiene (London), Vol. XI, No. 2, July, 1911.

Following 195 experimental bites through tuberculin, vaccine lymph, and staphylococcus emulsion upon himself and two others, with five needle-puncture controls, Walker questions the mechanical idea of disease transmission by the bites of fleas.

Although in no way affecting the conclusion that fleas are responsible for plague conveyance, the above-recorded experiments are at variance with the views which at present meets the most acceptance regarding the mechanism by which fleas transmit the disease. It appears that yet further inquiry is needed.—(C. N. F.)

HALL, P. M., Com. of Health, Minneapolis. **Garbage receptacles.** Journal American Public Health Association, Vol. 1, No. 7, p. 508, July, 1911.

In most cities the garbage can, while performing a very necessary function in municipal sanitation, has constituted a fly-breeding and malodorous nuisance in itself. Decay and putrefaction are hastened by heat, moisture, and flies. In his own city, Hall states that the nuisance has been satisfactorily abated since the following rule for the householder was put into practice in February, 1907:

Drain garbage of all moisture, then wrap it in paper before putting it in the can, and it will neither smell bad in hot weather nor freeze and stick to the can in cold weather. Do this and have a clean can at all times.

A 20-gallon can for the average-sized family need not require emptying oftener than once a week. Old newspapers or wrapping paper and twine are usually available for wrapping the garbage from which the water has been drained.—(C. N. F.)

HILL, LEONARD, ROWLAND, R. A., and WALKER, H. R. **The relative influence of the heat and chemical impurity of close air.** London Hosp. Med. Col., Journal of Physiology, Vol. 41, 1911.

These experiments are of unusual interest in showing the fallacy of assuming carbon dioxide to be the important toxic component of expired air in relation to ventilation conditions. Heat and humidity are of far greater importance.

The tests were performed in an air-tight chamber of 2 meters cubic contents and fitted with an electric stove, three electric fans in the roof, and glass windows.

First series.—Eight men were shut up in the chamber. No ventilation was allowed. After 44 minutes the dry bulb stood at 87° F.; the wet bulb 83° F. The CO_2 had risen to 5.26 per cent. The oxygen had fallen to 15.1 per cent. The discomfort felt was very great, all were wet with sweat, and the skin of all was flushed. The talking and laughter of the occupants had gradually become less and then ceased.

Immediate relief resulted from turning on the electric fans and whirling the air in the chamber—very great relief in spite of the temperature of the chamber continuing to rise. On turning off the fans the discomfort returned—the occupants cried out for the fans. It is of remarkable interest that no headaches or after effects have followed this type of experiment, which has been repeated five times.

Several series.—Two men were shut up in the chamber—a subject and an observer. The electric heater was used to raise the temperature to about 85° F. wet bulb. The subject inhaled through a soda-lime tin and exhaled through an air meter. In this way CO_2 was inhaled only in traces. The pulse frequency, pulmonary ventilation and body temperatures were recorded. The turning on of the fans gave complete relief to the feelings of discomfort and lowered the pulse frequency. Having proved this, the subject ceased breathing through the soda-lime tin. A bag containing CO_2—enough to raise the percentage in the chamber to about 2 per cent—was opened and the CO_2 allowed to escape into the chamber unknown to the subject. The sudden increase of CO_2 had no influence on the discomfort; it was not raised, in spite of the increased depth of the respirations. The turning on of the fans relieved the discomfort as before and vice versa.—ASST. SURG. E. W. BROWN.

HENRIET, H., and BOUYSSY, M. **Method for measuring the degree of vitiation of the air of inclosed spaces.** Compt. & Rend. 1911, vol. 152.

The authors assert that a determination of the quantity of reducing substances in the atmosphere of a room or other inclosed space affords an index of its degree of vitiation. These excretory products are condensed simultaneously with the moisture of the air.

so that by condensing a given volume of moisture, calculating the corresponding volume of air and estimating the reducing substances in the condensed water, comparative values are obtained. For this purpose a cylindro-conical vessel with a capacity of 3 liters is used. Another vessel containing a mixture of ice and salt is fitted into the first. The moisture of the air is condensed and frozen on the outer surface of the cylinder. On removing the freezing mixture the ice on the outer surface of the cylinder melts, is collected and weighed. The volume of air from which a given weight of water is condensed may be calculated from the following formula:

$$V = \frac{M(1aT)}{ad} \cdot \frac{76}{f}.$$

V = volume of air and water vapor at T° C. and at the pressure H; M, the weight of the vapor; *a*, the weight of 1 cubic centimeter of air; *d*, the specific gravity of the vapor, and *f*, its tension.

Reducing the volume of the mixture to 0° C. and 760 millimeters pressure—

$$Vo = \frac{1}{ad} \cdot \frac{MH}{f} = \frac{1.243MH}{f}.$$

For estimating the reducing substances, 5 grams of the condensed water are boiled for 5 minutes with 10 cubic centimeters of a solution containing 0.316 gram of $KMnO_4$ and 0.425 gram of chromic acid per liter. After cooling, 10 cubic centimeters of a solution of ferrous ammonium sulphate and 10 cubic centimeters of 66 per cent H_2SO_4 are added. The mixture is now titrated with $\frac{n}{500}$ $KMnO_4$. The difference between the amounts of permanganate consumed in this titration and in a blank experiment is a measure of the reducing substances derived from the air. The results are calculated into the number of milligrams of oxygen per 100 cubic meters of air. The following results were obtained: Atmospheric air, 1; printing works, 13; badly ventilated office, 14; a badly ventilated passage, 17; and a dressmaker's workroom with windows closed, containing 20 workers, 21.—ASST. SURG. E. W. BROWN.

TROPICAL MEDICINE.

By Surg. C. S. BUTLER, United States Navy.

H. B. HARRIS, M. D. **The diagnosis of pellagra.** The American Journal of The Medical Sciences, May, 1911.

It is unfortunate from the standpoint of diagnosis and treatment that most of the American literature upon pellagra emanates from insane asylums, where the disease is seen in its late stages and the patients no longer capable of benefit by treatment. Our writers,

speaking of "acute pellagra," have confused the sudden and typical manifestations occurring in the course of the disease with its actual beginning. The disease is chronic, and there is no such thing as acute pellagra. Descriptions are consequently not correct for the earlier symptoms, though these have been known since the disease was first described.

The symptoms to which the writer would draw attention are antecedent to erythema, denuded tongue, ulcers in the mouth, diarrhea, and the mental phenomena. Many pellagrous individuals never show the characteristic phenomena, but remain throughout their lives victims of a mild degree of poisoning which manifests itself in symptoms regarded as of no importance.

Though pellagra (Italian) and mal de la rosa (Spanish) was unquestionably known to the common people long before it was taken up by medical men, it was not until 1735 that the disease was first described by Casal. The Italian writers, from Frapoli (1771), who introduced the term "commencing pellagra," down to a late date, have from time to time made note of the early symptoms. Sussana and Frua (1855–1859) speak of the frequency of pyrosis and a burning sensation in the stomach. Cephalalgia, a feeling of heat and heaviness in the head, vertigo, a tendency to melancholia, a general breakdown and muscular feebleness, constipation or diarrheal stools almost without odor, red tongue, its surface smooth or covered with numerous villosities, along with furrows running in every direction, ofttimes tremulous, and almost always a little swollen, are the findings according to them.

Roussel also recognized a commencing period in pellagra and thought that the symptoms already referred to, though they might be the result of some other trifling complaint, were, nevertheless, diagnostically important where pellagra was endemic. He also acknowledged that such symptoms might persist for a time and then gradually abate without the development of the typical syndrome. The writer thinks this may repeat itself from year to year without the more typical symptoms developing.

In the matter of "pellagra sine pellagra," i. e., pellagra without skin lesions, the author thinks that many writers are disposed to beg the question. Strombio first used the term and some writers have since ignored it entirely; others have given scant notice to it. Vales calls it "the most important anomaly seen in this disease."

Accepting the maize theory of causation, the author thinks that we may safely trust to *a priori* reasoning in this instance. If caused by maize, the malady is certainly due to toxins forming in the cereal and not to living bacteria. These chemical entities, probably of alkaloidal nature, may be justly compared in their effects to similar poisons with whose action upon the human organism we are familiar.

Thus with small doses of strychnine we will get the effect, with larger doses the physiologic action is manifest, while with still larger doses we see the toxic action and perhaps death. Belladonna, another drug acting upon the nervous system, may be so administered that it impairs the health, destroys ultimately the mental faculties, and produces death. The comparison between belladonna and the pellagra toxin is apt, since in both instances alienation and death are the consequences of taking small doses of either for a sufficient time, both evidently acting upon the nervous system.

Assuming as true that pellagra is toxogenous, it follows that differing quantities of the toxin will produce different degrees of poisoning. We should, therefore, be able to discover symptoms in those earlier stages of the disease. As to other toxins, so to that of pellagra, different individuals manifest different degrees of tolerance. The question of acquired immunity has also to be considered. Some facts would seem to indicate that those who have suffered from a pronounced form of pellagra are thereafter exceedingly susceptible to small amounts of the toxins.

On theoretical grounds there can be no objection to the correctness of Strombio's view that there can be pellagra without skin lesions. The writer thinks that patients may manifest year after year a well-defined series of disturbances without there being an erythema, mental symptoms, or ulcerating changes in any part of the gastro-intestinal tract. Such patients would develop frank pellagrous symptoms if given a sufficient quantity of the toxin.

The clinical picture of pellagra would be different if the disease were due to a living virus. In this case there would be a progressive clinical picture with well-defined stages until a termination in recovery or death. If the disease were an infectious process it would not for years make itself manifest at certain seasons with intervening periods of practically perfect health.

Beginning symptoms are partially temporary (a month or so), followed by almost complete return to health. Other symptoms in course of time appear and ultimately become chronic.

While in good health during the winter, these patients usually manifest "bilious" attacks during the spring, summer, or autumn. The tongue is furred and there is indigestion with intestinal putrefaction, a feeling of malaise, mental and physical depression. This recurring from time to time, these patients finally reach a stage of more or less constant indigestion during spring, summer, and autumn. A burning sensation and a feeling of heaviness in the region of the stomach, accompanied by pyrosis, occurs. Intestinal fermentation is indicated by considerable quantities of flatus.

More advanced symptoms.—The first-mentioned symptoms having gone on for a number of years, there comes a time when the patient

becomes unaccountably and curiously weak, with no disposition to engage in any physical labor. He views life gloomily and ceases to care for those things which formerly interested him. Vertigo and disorders of sensation, particularly a burning which now is not confined to the stomach, but occurs in other parts of the body, especially in the feet and legs. It is highly probable that these patients have disorders of the cutaneous nerves of touch, pain, heat, and cold. Muscle sense is unaffected. Patients are not ataxic. Pains in the abdomen with frequent vomiting occur; also marked increase in reflexes; occasionally no change or a decrease will occur. It is not possible to make a diagnosis from the earlier symptoms referred to, but when bad health in spring, summer, and autumn repeated for a number of years is followed by an unaccountable loss of physical strength and mental vigor, a gloomy outlook on life, burning sensation in stomach, legs, and feet, digestive disturbances, and a change in reflexes, the clinical picture is definite for pellagra. If in doubt, take the same precautions as if the diagnosis were certain.

The writer has seen many cases conforming to the above description immediately manifest improvement when directed to leave off corn products, and instructed to rest in bed, eat good food, and given arsenic. The reflexes of such patients remain unchanged and it is probable that the organic damage done to cord and the parenchymatous cells of the central nervous system can never be repaired. If the precautions are observed, there will be no return of the disease. The author outlines the history of three cases in support of his view.—(C. S. B.)

M. LEFEBORE. **Researches upon acarids among lepers (from the biological laboratory, bureau of science, Manila, P. I.).** The Philippine Journal of Science, November, 1910.

This is a report upon investigation carried out to determine the probabilities in Borrel's hypothesis of transmission of cancer and of leprosy by *Demodex folliculorum*. The author's work was principally upon the hypothesis in its application to leprosy. The material was from lepers in San Lazaro Hospital in Manila and consisted of the contents of sebaceous glands collected in vivo, cutaneous nodules excised from living lepers, and pieces taken at autopsy. Fixation by saturated solution of $HgCl_2$ plus 0.5 per cent acetic acid. Sections were stained with either Ziehl-Neelsen or with eosin crystal violet, Gram.

First, the author attempts to define the number of normal and leprous individuals harboring *Demodex folliculorum*. It is difficult to get exact figures for healthy persons. Diseases of various types modify the quantity of sebaceous matter in which *Demodex folliculorum* lives. Published figures of different authors vary consider-

ably in regard to the prevalence of this acarine. From 10 per cent to 66 per cent are the limits. The author's investigations lead him to believe that, excepting children, who do not harbor the parasite, it occurs upon only 25 per cent of healthy persons. An important fact bearing against Borrel's hypothesis is that children who rarely harbor *Demodex* are frequent subjects of leprosy.

Comedones make invasion of the sebaceous glands by *Demodex* more difficult than if the gland ducts were normal. If a comedon develops in a gland already infected with this parasite, the larvæ or eggs can not escape to infect other glands. Although *Demodex* was at times found in sebaceous glands from the nonulcerating facial lesions of leprosy, it was never found once the lesions had undergone ulceration. The observations show that not more than 25 per cent of lepers harbor the acarine. Pathologically leprosy and cancer are dissimilar: "1. The external lesions of leprosy, not only the deformations, the mutilations, and the anæsthetic areas, but even those disturbances which end in the formation of cutaneous nodules, do not primarily originate at the point where they are observed, but are dependent upon deeper causes, some simply nervous, others circulatory.

"2. The accumulation of leprosy bacilli in the hypertrophies of the skin is the result of an exportation from the interior of the organism, the object of these formations being to localize, to destroy, and to eliminate the bacilli."

The writer thinks it difficult to reconcile the observed facts with the hypothesis that *Demodex folliculorum* is the principal agent of leprous contagion, and is of opinion that no positive argument can be drawn from the existence of external leprous lesions to prove that contagion takes place by way of the skin.

From a consideration of the known facts in the life history of *Demodex folliculorum*, it is unlikely that it could take an active part in the spread of leprosy. It is the only member of the family Demodecidæ which is a fixed parasite living in the skin, the other members being more or less migratory. Once having entered the follicle it remains there throughout its life. The eggs, or more likely the larvæ, carried out with the sebum are perhaps responsible for the infections of other follicles or other individuals. Just how, is not known. The animal moves with great difficulty, owing to the comparatively minute legs and the fact that usually it is surrounded by sebum. It could transmit the contagion of leprosy only in the same way as the sebum itself.

The author considers the likelihood of the migratory acarids, such as *Sarcoptes* and *Tyroglyphus*, acting as transmitters of leprosy. His conclusion is adverse to their having anything to do with the matter. He mentions a probably new parasitic acarid which appears to be similar to the genus *Tyroglyphus*.—(C. S. B.)

NICOLLE and CONSEIL. **Action of "606" upon malaria.** Bulletin de la Société de Pathologie Exotique, December 14, 1910. Trans. from Bull. Mensuel, Tome III, No. 3, March, 1911.

According to the authors, the action of "606" upon malaria is most marked. This action is very rapid and provokes an amelioration of the general symptoms almost immediately, causing lowering of temperature and diminution of the number of protozoa. This action is neither lasting nor complete. According to the authors, this mode of treatment can be made to render good service in the treatment of malaria by associating it with the classical quinine treatment.—(C. S. B.)

PATHOLOGY AND BACTERIOLOGY.

By Passed Asst. Surg. M. E. HIGGINS, United States Navy.

BAINBRIDGE, F. A., and DUDFIELD, R. **An outbreak of gastroenteritis caused by B. paratyphosus (B.).** Journal of Hygiene, Vol. II, No. 1, March, 1911.

The writers describe an outbreak of what was thought to be "food poisoning," which occurred in a boarding house. Eight of 25 persons living in the house were affected. The symptoms were abdominal pain followed by vomiting, diarrhea, and a fever rising as high as 103° F. and lasting for various periods up to a week.

Organisms indistinguishable from standard strains of *B. paratyphosus* were isolated from the stools of two of the patients. Blood obtained from six of the patients, with one exception, agglutinated *B. paratyphosus.*

In their conclusions they point out that the paratyphoid organism is capable of giving rise not only to paratyphoid fever, but also to an acute gastroenteritis simulating food poisoning. They considered that, in the outbreak which was the subject of their investigation, the source of infection was probably a paratyphoid carrier.—(M. E. H.)

MARKS, HENRY K., M. D. **Infection of rabbits with the virus of poliomyelitis.** Journal of Experimental Medicine, Vol. XIV, 2, August, 1911.

In the earlier part of this article Marks reviews the work of investigators of the question whether rabbits succumb to the inoculation of the virus of poliomyelitis. The majority failed to produce effects in rabbits by inoculation of tissues of the spinal cord and brain of human and of experimental (monkey) poliomyelitis. Those who claim that rabbits may be infected with the virus and that many succumb to its effects were unable to reproduce in rabbits either the symptoms of the human affection or the characteristic histological lesions present in the nervous systems of man and the monkey.

He then describes experiments along this line recently conducted at the Rockefeller Institute. They injected rabbits intravenously and intraperitoneally with virus of poliomyelitis in the form of filtrates prepared from the central nervous system of a poliomyelitic monkey. Filtrates and emulsions of the brain and cord and in some instances of the spleen, liver, or defibrinated blood of the rabbits which died were used to carry forward the inoculation from rabbit to rabbit. In two instances it was transmitted through a series of six rabbits. None of the rabbits, however, showed the characteristic symptoms or post mortem histological lesions of poliomyelitis as it occurs in man or in the monkey.

In order to determine whether these rabbits carried, even if they did not necessarily succumb to, the poliomyelitic virus, three monkeys were inoculated with filtrates prepared from the brain and cord of rabbits which died during the experiments. These retransfers to the monkey were made after the second, fourth, and sixth rabbit passage, respectively. All three monkeys showed the characteristic tremors of the head and paralysis of the arms and legs. Death occurred on the eighth, nineteenth, and sixth days after inoculation, and in each case the post mortem and histological findings were characteristic of experimental poliomyelitis.

These experiments are taken to indicate that the virus of poliomyelitis can be propagated in certain individual rabbits, at least through a limited series of inoculations. But nothing resembling the characteristic lesions of the central nervous system in human beings and monkeys has appeared in the rabbit as a result of the inoculation of the strains of poliomyelitic virus thus far employed to infect them.

Applying these findings to the question of the transmission of the disease to human beings, Marks states:

> It is now established that the virus of the disease can survive and probably even be propagated in a domestic animal that does not show any of the peculiar symptoms of epidemic poliomyelitis as it occurs in man. Conceivably, therefore, some animal, in relation to man, may act as a reservoir for the virus, which only occasionally and under special and peculiar circumstances transmits it to human beings.

As instances of "animal reservoirs of pathogenic microorganisms" he mentions the connection between the wild goat and Malta fever, and between the wild antelope and sleeping sickness.—(PASSED ASST. SURG. P. E. GARRISON.)

LEVIN, I, and SITTENFIELD, M. J. **The mechanism of the formation of metastases in malignant tumors.** Journal of Experimental Medicine, N. Y., Vol. XIV, No. 2, August 1, 1911.

In this article the authors discuss the transfer of tumor cells to new foci of infection and also the difference in localization of different kinds of malignant tumors. Until recently it was generally accepted

that the second question depended upon the first. For example, it was supposed that carcinoma metastasizes through the lymphatics and sarcoma through the blood vessels. But it is pointed out that the work of Von Recklinghausen, Goldmann, and Schmidt has refuted this older theory. Goldmann proved that there is an extensive invasion of tumor cells into the coats of blood vessels in carcinoma as well as in sarcoma; that there is a very intimate relation between the lymph and blood vessels; and that carcinoma cells enter blood vessels just as readily as sarcoma cells do. Schmidt found carcinoma nodules in the lumina of blood vessels of the lungs in 15 of 41 autopsies of cases of carcinoma of the abdominal viscera, and in none of these cases was there any lesion of the walls of the pulmonary blood vessels.

Since the specific localization of various malignant tumors can not be explained as due to difference in channels of transportation, other theories are offered. Neusser, Bamberger, and Paltauf believe that certain organs possess a peculiar affinity for cells of certain malignant tumors. Schmidt, Lubarsch, and Von Recklinghausen think that the phenomenon is caused by differences in the morphology of the organs.

Having briefly reviewed the existing status of the subject, Levin and Sittenfield describe experiments recently conducted by them on various tumors of white rats and mice. These experiments consisted chiefly of injections of tumor emulsions into rats and mice, and subsequent necroscopic search for metastases.

The tumors used were: Sarcoma of the rat, carcinoma of the rat and sarcoma of the mouse.

With *sarcoma of the rat,* hundreds were inoculated subcutaneously. Local tumors formed, but metastasis occurred in only one case and that was to the liver. Thirty-six rats received an injection in the jugular vein and 6 in the carotid artery. In these no metastasis occurred. To test the possibility that negative results were due to deleterious effect of the circulating blood, 30 rats were injected subcutaneously with a mixture of tumor cells and defibrinated blood, other rats being at the same time injected with the tumor emulsion alone as a control. The results indicated that the blood does not affect the tumor cell.

With *carcinoma of the rat,* 16 rats received an injection in the jugular vein. In 3 of these, metastases were found in the lungs. Six rats received an injection in the carotid. Of these one showed metastasis to the lung, and another to the left ventricle. Seven rats received inoculation in the bone marrow. In two of these, metastases were found in the lungs. Twenty-four rats received injection in the knee joint. Of these, four showed metastases in the lungs

With *sarcoma of the mouse*, 20 mice received an injection in the jugular. None showed metastasis. Twelve rats received an injection in the jugular. Of these two showed metastatic nodules in the liver. Fifteen rats received injection in the knee joint. One of these showed metastasis to the liver, and in another the blood vessels of the fat surrounding the opposite inguinal gland were completely filled with tumor cells.

Deductions from the results of these experiments:

1. The occurrence of metastatic tumors in mice and rats is rare as compared with the occurrence of metastatic tumors in human cancer.

2. In these animals the cancer cells metastasize through the blood vessels only, since the lungs and liver could be reached, from the points of injection, only through blood vessels.

3. Since the carcinoma selected the lungs and the sarcoma the liver, and the morphology of the channels of transportation was the same for both, "the most plausible explanation for the different localization of metastasis in the different kinds of malignant tumors is that it is due to a specific affinity between cancer cells and cells of certain organs."—PASSED ASST. SURG. P. E. GARRISON.

NOGUCHI, H., M. D. **A method for the pure cultivation of Pathogenic Treponema Pallidum (Spirochæta pallida).** Journal of Experimental Medicine, XIV, 2, August, 1911.

In an introductory paragraph Noguchi refers to the fact that Schereschewsky, in 1909, was the first to demonstrate that *Treponema pallidum* might be cultivated, and reviews the attempts of several investigators to obtain pure pathogenic cultures of this organism. Though some obtained it in pure culture and others succeeded in obtaining syphilitic lesions in rabbits by the use of "young impure cultures" which still contained the original syphilitic tissue, no one, up to the time of the present report, had reproduced syphilitic lesions by means of pure cultures of *Treponema pallidum* and thus given final proof that this microorganism is the causative agent of syphilis.

Unlike previous investigators, who used human syphilitic tissues, Noguchi obtained his culture material from the spirochætæ containing testicular tissue of rabbits which had been inoculated with human syphilitic material. The advantages claimed for rabbit material are: (1) Availability, and (2) the fact that the spirochætæ are almost free from commonplace bacteria, especially after several passages through rabbits.

His culture medium consists of serum water to which a piece of sterile rabbit tissue is added. This medium is made as follows: To

1 part of blood serum (sheep, horse, rabbit) add 3 parts of distilled water. Using tubes 20 centimeters high and 1.5 centimeters wide, place in each tube 16 cubic centimeters of serum water. Sterilize at 100° C. 15 minutes each day for three days. Then place in each tube a piece of freshly removed sterile tissue and incubate at 37° C. for two days, and then test sterility. The rabbit tissues best adapted to this purpose are the kidney and testicle.

To obtain the first generation of the *Treponema pallidum* in virulent form, the following conditions are essential: (1) The presence of suitable fresh sterile tissue in serum water; (2) strict anaërobiosis; (3) a slightly alkaline reaction as furnished by the serum and tissue; and (4) a temperature of about 35° to 37° C.

After inoculating the medium with syphilitic testicular rabbit tissue, Noguchi adds a layer of sterile paraffin oil to each tube, places them in a jar similar to the Novy anærobic culture jar, and gets rid of oxygen by combining three methods. First, hydrogen is passed through, then a vacuum pump is used, then concentrated solution of potassium hydrate is passed into a solution of pyrogallic acid already in the bottom of the jar and, finally, the jar is filled with hydrogen and closed. The whole is then placed in the 37° C. incubator.

Pathogenicity.—Up to the time of sending this article to the publisher (June 8, 1911) only two strains of pure culture had been carefully tested for their virulence. Both strains have produced typical lesions in the testicle of the rabbit.

In conclusion, he points out that this is the first time that *Treponema pallidum* of Schaudinn has been proven beyond all doubt to have been obtained in pure culture. He also states that it may now be accepted as established that the testicular lesions produced in rabbits by means of syphilitic materials are the result of the multiplication of the pallida and not of some associated indefinite parasite.—PASSED ASST. SURG. P. E. GARRISON.

MEDICAL ZOOLOGY.

Passed Asst. Surg. P. E. GARRISON, United States Navy.

LEIPER, R. T. **On Kwan's fluke and the presence of spines in Fasciolopsis.** Journal Tropical Medicine and Hygiene, London, vol. 14, 8, pp. 119–120.

In 1908 Heanley described a trematode which had been obtained by Dr. Kwan King Hung from a child in Hongkong and suggested that it might be a new species. On the strength of Heanley's report and illustration the parasite has been recognized in medical literature as a doubtful species under the name "Kwan's fluke." Leiper has studied the original material and pronounces it to be a specimen of *Fasciolopsis buskii* much mutilated by partial digestion. Heanley

had noted the presence of cuticular spines on his specimen, and in this connection Leiper says that from his study of numerous specimens of *Fasciolopsis* he is led to believe that spines are normally present in this genus, but that they are not so stout, dense, or deeply set as in *Fasciola* and may be easily lost, thus accounting for their absence in the descriptions of many helminthologists.—(P. E. G.)

FERENBAUGH, THOMAS L., A. B., M. D., First Lieut. Med. Corps, U. S. A. **Endemic Mediterranean fever (Malta fever) in southwest Texas.** Journal American Medical Association, August 26, 1911.

The author reports five cases of Malta fever in which agglutination tests with the *Micrococcus melitensis* were positive in each case. Patients, all young men from 11 to 20 years old, had worked at a goat camp, were quartered in a house surrounded by the dusty bedding ground of the goats, and were using goat's milk. Some of the goats were ill with fever.

Malaria was excluded in each case by blood examination. Quinine given in large doses over a period of two weeks had no effect on the temperature of any of the five patients.

These cases appear to be the first well-authenticated infections of Malta fever contracted in this country.—(P. E. G.)

CHEMISTRY AND PHARMACY.

Asst. Surg. E. W. BROWN and Pharmacist O. G. RUGE, United States Navy.

MICHEL, F. **Detection of blood by means of leuco-malachite green.** Chem. Zeit., 1911, vol. 35.

The reagent is prepared by dissolving 1 gram of leuco-malachite green in 85 grams of glacial acetic acid, and the mixture is diluted with distilled water to 350 cubic centimeters. This reagent in the presence of blood and dilute hydrogen peroxide gives a green color reaction. One drop of the solution to be tested for blood is treated with 5 drops of this reagent and 2 drops of 1 per cent hydrogen peroxide. The detection of as small a quantity as 0.002 milligram of blood is claimed.—(E. W. B.)

MICHEL, FRANZ. **An improved form of Heller's ring test for detection of albumin in the urine.** Chem. Zeit., vol. 35, p. 183, 1911.

This modification appears to have a real practical value. In carrying out Heller's technique in the usual way much care has to be taken that the concentrated nitric acid and the urine to be added do not mix, as otherwise the acid tends to dissolve the albumin and a turbid zone between the liquids is not obtained. The author, in

order to prevent the liability of this mixing, increases the specific gravity of the nitric acid by saturation with ammonium nitrate. About 2 cubic centimeters of the reagent thus prepared are placed in a test tube and 1 cubic centimeter of the urine under examination added drop by drop from a pipette. If a large amount of albumin is present a sharply defined ring is produced at once; with traces it appears in a short time. If the test tube is shaken greatly the whole of the urine layer becomes turbid, whereas if ordinary concentrated nitric acid is employed the turbidity dissolves at once. On heating the turbid fluid with continual shaking it becomes clear, but when cooled again the albumin once more separates as a more or less pronounced turbidity. In the test with ordinary nitric acid the albumin is immediately decomposed in the cold and the solution can not again be made turbid.—(E. W. B.)

BENEDICT, STANLEY R. **An important reagent for Fehling's method for sugar estimation.** Journal of Biological Chemistry, vol. 9, pp. 57–59, 1911.

The cuprous oxide is held in solution and the end point is the disappearance of the blue color. In place of the Fehling's solution the following mixture is recommended, as it is much more sensitive and keeps well indefinitely, i. e., copper sulphate, 18 grams; sodium carbonate, 200 grams; sodium citrate, 200 grams; and potassium thiocyanate 125 grams, 5 cubic centimeters of a 5 per cent potassium ferrocyanide solution, and distilled water up to a liter. The copper sulphate is the only constituent that needs careful weighing. The ferrocyanide prevents the precipitation of the cuprous oxide. Twenty-five cubic centimeters of the mixture are reduced by 0.05 gram of dextrose and 0.053 gram of levulose. The advantage of one solution as compared with the two necessary for the Fehling's process is obvious. The technique of the titration is similar to Fehling's.—(E. W. B.)

SCHRÖTER, F. **Method for the estimation of urotropin in the urine.** Archiv für experimentelle Pathologie und Pharmakologie, 1911, vol. 64, pp. 161–166.

Principle.—Mercuric chloride when added to weakly acidified urine precipitates urotopin completely and uric acid incompletely. No other constituent is precipitated. The urotopian compound is soluble in sodium chloride solution, which property enables its separation from the uric acid compound.

Technique.—One hundred cubic centimeters of the urine are mixed with 10 cubic centimeters of 25 per cent acetic acid and treated with 120 cubic centimeters of saturated mercuric chloride solution. After 12 hours the precipitate is collected on a filter, then digested on the water bath with 15 cubic centimeters of saturated sodium chloride solution and again filtered. The hexamethylenetetraamine-mercuric

chloride compound dissolves in the sodium chloride solution and, after the mercury has been removed by the addition of sodium hydroxide solution, the nitrogen in the filtrate is estimated by Kjeldahl's process. The amount of nitrogen found is then calculated into urotropin.—(E. W. B.)

HIRSCHBERG, M. **Detection of amylolytic ferments in the feces.** Deutsche medicinische Wochenschrift, 1910, vol. 36, pp. 1992–1997.

The functional activity of the pancreas may be tested by determining the amylolytic powers of the enzymes (lipase and trypsin) in the feces and the following method is recommended. A weighed portion of the feces is well mixed with 1 per cent sodium chloride solution and the mixture thoroughly centrifuged. The liquid portion is measured and quantities of it are introduced into test tubes containing 5 cubic centimeters of a 1 per cent starch solution, each tube in the series receiving a somewhat larger portion of the fecal extract than the preceding one. The tubes are then maintained at 38° C. for 24 hours and the contents of all the tubes are brought to the same volume by addition of water. Iodine solution is now added to each tube, and note is taken of the tube in which all the starch has been changed with the least possible quantity of the extract. The diastatic power of the extract can then be expressed in terms of cubic centimeters of extract per 5 cubic centimeters of starch solution.—(E. W. B.)

FOLIN, O., FARMER, C., MACALLUM, A. B., and PETTIBONE, C. V. J. **New technique for the clinical estimation of total nitrogen, ammonia, and urea in the urine.** Journal of Biological Chemistry, vol. 9, No. 2. Proceedings American Society Biological Chemistry, 1911.

The details of these new methods have not yet been described but will be published shortly. Coming from such a high authority as Dr. Folin it may be taken for granted that the work will be of unusual interest from the clinical chemist's viewpoint. It is claimed that extremely small quantities of urine, e. g., 0.1 to 1 cubic centimeter may be used. The ammonia formed is set free by an air current instead of by distillation, and is subsequently estimated colorimetrically by means of Nessler's reagent and a colorimeter. By these methods the total nitrogen is estimated in about 20 minutes, the urea in almost 25 minutes, and the ammonia in about 15 minutes.—(E. W. B.)

TURNER, J. L. **Chemotherapy and "606."** Bulletin of the American Pharmaceutical Association, February, 1911.

The author outlines the fundamental principles of the new science, experimental chemotherapy, the study of the action of remedies on infected organisms, a branch of pharmocology brought into prominent

notice by the great interest attaching to Prof. Ehrlich's organic arsenic combination, "606," which latter is the first practical result achieved by the new science. The purpose of chemotherapy, he states, is to discover specific remedies by means of systematic and extensive experimentation on animals, and then further to explain the cause of the curative action of specifics. The introduction of the principle of selective affinities of remedies was a step in this direction. Ehrlich found that the distribution of various dyestuffs in the tissues of a living animal was entirely dependent on their chemical constitution. e. g., methylene blue colors only the nervous system; neutral red is fixed by granules of the cell; thus a division of the dyestuffs into neurotropic, lipotropic, and polytropic, dependent upon their fixation by nervous system, fat tissue, etc., can be established. The therapeutic action of any agent is likewise dependent on its affinity or "tropy," so remedies are classified as neurotropic, organotropic, parasitotropic, etc. In infectious diseases, for instance, the ideal remedial agents should possess purely parasitotropic functions and have no action at all organotropically; in other words, possess great affinity for parasites in doses which have no hurtful effects on the organism. While in serotherapy we possess such ideal remedies the latter is not applicable in a number of infectious diseases, such, for example, as are produced by trypanosoma and spirilla. Here, then, is where chemotherapy replaces serotherapy, where chemical agents must be found that act as specifics, and to find such specifics is the aim of chemotherapy. The methods employed in the search for these remedies are those of chemical synthesis.

After the introduction into therapy of atoxyl (an arsenic derivative of anilin) and its proven efficiency in combating diseases produced by trypanosoma, it was found that this remedy also had a curative action on syphilis. The harmful effects however of atoxyl on human organisms made it desirable to find similar preparations which would possess stronger curative action and be at the same time less toxic. The assumed chemical constitution of atoxyl as anilid of meta arsenic acid seemed to eliminate it from any possibility of experimentation synthetically. In Ehrlich's first experiment with atoxyl, however, he found its chemical constitution different from that generally assumed, and his proof that atoxyl was not a chemically indifferent anilid but a very stable and reactive amido derivative of phenyl arsenic acid (arsanilic acid) opened a wide field for chemic and biologic investigation. A large number of derivatives, all containing arsenic in organic combination, were easily obtained by the substitution of various chemical groups, the introduction of these groups greatly varying the toxicity of the product. After establishing the toxicity of these substances, an investigation

of their action on trypanosoma was made. Successful results were attained with mice, the achievement arrived at being complete sterilization of a highly infected organism by means of one injection—Ehrlich's ideal of "therapia sterilisans magna." It was naturally inferred that arsanilic acid acted directly on the trypanosoma. This, however, was disproved by test tube experiments, and so necessarily forced the assumption that a cleavage product was formed from these arsenicals; in other words, that the organism modifies them, forming trypanocide substances. The reducing power of animal tissues offered itself as the most plausible explanation of this action. The object then was to find an active agent prepared outside of the body, and not leave the necessary synthetic work to the organism.

The oxygen compounds of arsenic are of two types, arsen*ic* and arsen*ous*, in which arsenic functions as a quintavalent and trivalent element, respectively. Arsanilic acid and the arsenicals used in the experiments up to this point all belonged to the first group, i. e., functioned as quintavalent elements, so that the next step was the preparation of reduction products of arsenilic acid in which arsenic would have the function of a trivalent element. This was done and the chemical change, the abstraction of oxygen from the product, resulted in complete change of its biologic properties. Its influence upon trypanosoma in test tube experiments proved enormous. Thus was proven the assumption that arsanilic acid had no influence in the organism, but that living tissue reduced a small part of the amount introduced which then acted as a trypanocide agent. A compound (No. 418 in a series of products prepared by Ehrlich) was finally found which accomplished the desired results with regard to trypanosoma, namely, a sufficiently large dose to kill all the parasites could be introduced into the organism without causing any damage to the animal. This remedy had little effect on spirillæ, however. But Ehrlich firmly established the fact that the destructive action of arsenicals depends primarily upon the trivalent arsenic radical in the arseno group. Continuing along these lines many hundred derivatives of phenyl-arsenic acid were prepared and tested biologically, the object being to find modifications increasing its activity and diminishing its toxicity. Dioxydiamidoarsenobenzol, No. 592 of the series, was finally introduced, and then its hydrochloride, No. 606, these having marked spirillocide action. The latter has been placed upon the market under the trade name of salvarsan.

The author believes that this progress in synthetic chemistry, and this new union of chemistry and therapy promises brilliant results.—(O. G. R.)

EYE, EAR, NOSE, AND THROAT.

Surg. E. M. Shipp, United States Navy.

Gonin, Dr. **Defective vision and its bearing on the question of fitness for service.** Revue Militaire Suisse, March and April, 1910. Journal of Royal Army Medical Corps, Vol. XV, No. 5, November, 1910.

Gonin begins with a general review of the conditions which are responsible for defective vision, with special reference to errors of refraction. He then proceeds to investigate the influence of defective vision on shooting. Among three companies he found 48 men whose vision on enlistment was noted as below normal.

The musketry sheets of these men showed the following results:

First group.—Men whose vision was equal to three-fourths (15/20) or two-thirds (13/20) of normal. During the recruits' course of musketry these men obtained an average of 79 points out of a possible 300. In the Landwehr course their average score was 90 out of a maximum of 240.

Second group.—Vision equal to one-half (10/20) normal. These men scored an average of 68 points in the recruits' course and 65 in the Landwehr course.

Third group.—Vision equal to one-third (6⅔/20) normal. This group averaged 62 points in the recruits' course and 60 in the Landwehr course.

The average points scored in the Landwehr course by the 48 men of defective vision was 71, as against 104 by the remainder of the three companies.

Gonin then tried the effect upon himself and others of wearing a concave or convex glass over the aiming eye while shooting at a target. He found that a myopia of more than 1.25 D. reduced the number of points scored to one-third or less; when both eyes were rendered equally myopic the results were much better.

Artificial hypermetropia did not interfere with vision to nearly as great an extent as myopia.

Artificially produced simple astigmatism not exceeding 1.25 D. had much the same effect as single myopia.

The writer next points out that the Swiss regulations permit the use of glasses in the army, and then enumerates the many objections to enlisting men as soldiers who are dependent upon the help of glasses for shooting, scouting, etc.

Gonin then describes his "lunettes de tir," a little instrument that he has devised to correct errors of vision, especially when shooting, and which he claims is not subject to the same objections as glasses. This consists of a spectacle frame in which one glass is replaced by a metal disk pierced with one or more holes, the diameters of which vary from 1 to 1½ or 2 millimeters.

By rotating the disk the soldier can find which opening suits him best, and looking through this hole he will find that he can see the

back and fore sights and targets much more clearly than with the naked eye. This device can only be used successfully where the error in refraction does not exceed 2 D.

He then enumerates the standards of vision required in recruits for various arms of the service.

1. *Infantry.*—The recruit must possess two-thirds vision (13/20) in the right eye without glasses, or after the correction of myopia or hyperopia of not more than 4 D.

2. *Cavalry.*—At present the recruit need only possess one-half normal vision (10/20), which he thinks is too low.

3. *Artillery.*—Here the standard required is 1 by Snellen's types (20/20), and he thinks that gun layers should possess at least 1¼ by Snellen's type (20/15) in one eye, but that it is immaterial which eye is the best. The remaining personnel of the battery should have normal vision in each eye (20/20).

4. *Machine gunners.*—These men should possess perfect vision in both eyes, on account of the enormous expenditure of ammunition which they control.

5. *Engineers.*—The standard is one-half vision (10/20), which is sufficient, as they are chiefly employed on technical work.

The author's findings are very interesting as well as instructive and show conclusively that good marksmanship, even with small arms, is not consistent with a moderate reduction in visual acuity, and, curiously enough, his standard for gun layers agrees exactly with the requirements for gun pointers in the United States Navy.—(E. M. S.).

FREDERICK, M. W. **"606" and eye diseases.** California State Journal of Medicine, May, 1911.

The writer states that to destroy the parasite without destroying the host is a problem that has often been presented to us in medicine, and never in a more concrete form than it has since the introduction of the organic arsenic compounds for the treatment of diseases due to protozoa and spirilla.

After trying a number of synthetic arsenic compounds Ehrlich now offers us salvarsan as the drug that will effect the greatest good with the least harm. Its predecessors enjoyed short favor and were abandoned chiefly on account of the harm resulting to the special senses, especially to the eye. Each one, as it appeared in the therapeutic firmament, was heralded as a speedy and harmless destroyer of protozoa and spirilla.

Of 1,633 patients treated by Koch for sleeping sickness with atoxyl, 22, or 1.5 per cent, became blind permanently; and of all the patients treated for this disease with atoxyl a total of 3 per cent lost their sight.

The author further states that the many unfavorable reports on atoxyl were sufficient to condemn it as false to its name.

Arsacetin was then introduced with assurances from Ehrlich, Neisser, and others that affections of the optic nerve were not to be feared after its use, but it, too, proved a dismal failure. The prevailing lesion following it was retrobulbar neuritis, with consecutive atrophy of the nerve. The same promises were made for soamin, a preparation containing 22.8 per cent of arsenic, but its administration was attended by the same disastrous results.

Thus, according to the author, one star after the other lost its splendor and was finally extinguished, and now a particularly bright new one has arisen, and we are to determine how long it will illuminate us with radiance. Salvarsan is claimed by Ehrlich to be free from the injurious effects which its predecessors exerted on the organ of sight. Twenty-five thousand to 30,000 cases have been treated with salvarsan with but one case of damage to the optic nerve, and this case is open to discussion.

The use of methyl alcohol has been discontinued in preparing the injection of salvarsan. When methyl alcohol was used transitory eye disturbances were noted in a number of cases.

The author further states that the continental journals, which teem with articles on this new remedy, bring us assurances from all sides that no untoward effect on the eye has been noticed from the use of salvarsan. Continuing, he quotes Wechselmann as follows:

> While damage to the optic nerve has never been observed from the use of salvarsan still it is advisable to make a careful examination of the fundus in order not to overlook any already existing neuritis; whereas at first all existing eye lesions were considered a contraindication for the injection, later suspicious cases were also treated. In eight cases of well-advanced atrophy, which were treated at the earnest desire of the patients no increase of the atrophy was observed.

The writer, continuing, states that having found out that salvarsan can do no harm, let us turn our attention for a moment to what good it has done in eye diseases. Stuelp has collected the records of 420 cases of syphilis of the eye that were treated by salvarsan and gives us the following statistics in regard to the outcome of the treatment:

1. Syphilis of the eyelids, 3 cases; cure in 100 per cent.
2. Syphilis of the conjunctiva, 8 cases; cure in 63 per cent.
3. Syphilis of the cornea, 95 cases; cure in 27 per cent.
4. Syphilis of the sclera, 5 cases; cure in 80 per cent.
5. Syphilis of the uveal tract, 85 cases; cure in 63 per cent.
6. Syphilis of the retina and optic nerve, 76 cases; cure in 63 per cent.
7. Syphilis of the muscles, 142 cases; cure in 33 per cent.
8. Syphilis of the orbit and trifacial nerve, 7 cases; cure in 100 per cent.

This gives an average of 66 per cent of cures, which is 11 per cent less than the percentage of cures in the cases of general syphilis collected by Plant.

The author also states that Wechselmann and Seeligsohn have given us in connection with this subject the best statistics in regard to the participation of the eye in syphilis, although his number of cases is only 250. The 12 cases of primary syphilis showed nothing.

In 124 cases of secondary syphilis 16 showed the following changes: six cases of 4 to 6 months' standing showed differences in the pupil widths with pupillary reaction still present; 1 case showed pupillary difference with rigid pupil of one side; 2 cases had bilateral pupillary rigidity to light, with reaction to convergence; 1 case showed vascular changes in the fundus, the infection being 2 years old; 1 case of fresh choroiditis peripherica luetica; 1 case of central luetic choroiditis; 1 case of fresh iridocyclitis papulosa; 2 cases of marked central choroiditis myopica.

Nineteen of the 77 cases of tertiary lues showed: In 15 cases disturbances of the pupillary function, and with 2 ophthalmoplegia incompleta or totalis; in 1 case each, changes in the retinal vessels, peripheral choroiditis, and remnants of old iritis; in 1 case beginning atrophy in one eye, complete in the other.

These authors did not hesitate to use the remedy even in the suspicious cases, and in no case was there any further damage to the eye. Of course, they advise an examination of the fundus prior to the use of salvarsan to note any existing lesion, so that any further development of that lesion may not be laid at the door of salvarsan; but in those cases that seem hopeless one should not hesitate to use the remedy To use a constant dose in all cases is absurd, as there is not alone the power of resistance to be considered but also the sensitiveness of the individual.

In conclusion the author states that, according to our present state of knowledge, there is no reason for refusing the patient the possible benefit of salvarsan on account of the injuries caused by the former arsenic preparations.

While there are yet many things to be determined, such as the largest dose which may be given with safety, the best method of introducing the drug into the system, the conditions which one may hope to benefit by salvarsan, etc., this much seems certain, that the eye condition is not a contraindication for the use of salvarsan.

As a matter of self-defense it is advisable to determine the eye conditions prior to beginning the use of the drug in order to protect oneself against criticism.

Even in those cases where degenerative changes in the optic nerve and its appendages have already appeared, one should not hesitate to use salvarsan, as it is difficult to determine exactly how much luetic disturbance is still present, and in some cases distinct improvement of a seemingly hopeless condition has been reported.—(E. M. S.).

REPORTS AND LETTERS.

AMERICAN MEDICAL ASSOCIATION MEETING.

The sixty-second annual meeting of the American Medical Association was held at Los Angeles, Cal., June 26 to July 1, 1911. The Medical Corps of the United States Navy was represented by Surg. C. P. Bagg, United States Navy, whose report follows:

I reported and registered as a member of the house of delegates of the American Medical Association at Los Angeles, Cal., June 26, 1911, at 9 o'clock a m., also registering as member of the American Medical Association the same day at registration hall.

Meetings of the house of delegates were held as follows:

Monday, June 26, 1911, forenoon and afternoon; Tuesday, June 27, 1911, afternoon; Wednesday, June 28, 1911, afternoon, special; Thursday, June 29, 1911, afternoon, final.

I attended the following meetings and sessions:

Monday: House of delegates forenoon and afternoon, and general public health meeting under auspices of Los Angeles Chamber of Commerce in afternoon, Col. W. C. Gorgas, Medical Corps, United States Army, speaker of the day.

Tuesday forenoon: General session of the association at Auditorium; installation of President John B. Murphy; afternoon meeting of house of delegates.

Wednesday forenoon, surgical section; afternoon, a special session of the house of delegates; evening, public reception to Dr. J. B. Murphy, president of the association.

Thursday forenoon, surgical section; afternoon, final session of the house of delegates.

Friday: Scientific and commercial exhibits and public health exhibits.

The house of delegates was called to order Monday, June 26, 1911, at 10.15 a. m., by retiring President William H. Welch, of Baltimore. Matters of particular interest were noted as follows:

Prof. Welch, in his farewell address to the members, suggested that an international congress of tropical medicine be held in San Francisco in 1915 in connection with the Panama-Pacific Exposition, affording thus an opportunity to commemorate the conquest of the Isthmus under the direction of Col. Gorgas, as well as other tropical sanitary conquests. Also recommended that a special committee be

appointed to consider the best mode of commemorating the sanitary work and achievements attending the construction of the Isthmian Canal, said committee to be provided with necessary authority and funds.

Dr. H. B. Favill, of Chicago, chairman of the council on health and public instruction, which council is made up of the following committees: medical legislation, board of public instruction, council on defense of medical research, organization, uniform regulation of membership, visual standards of pilots, public health education, prevention of blindness, and postgraduate study work, presented the report of the council, which had established for better division of work, bureaus of legislative organization, publicity, protection of medical research, and public health. Dr. Favill has the bureau of publicity in charge, in addition to being chairman of the council. He is a very strenuous worker and speaker, the report of the council covering 57 pages printed in fine type.

Better medical education was his principal theme in presenting a résumé of the report. The amount of work done by the council under each bureau is little short of phenomenal, ranging as it does from organizing in county medical societies, committees to teach the general public preventive medicine and sanitation, on through schools, factories, the public press, and even to the instruction of the profession at large in the latest and most approved instruments and appliances, for hospital, office and country practice uses.

Knowledge of the work done, both legislative and active, by State boards of health was acquired, so that the activities of the council were directed toward the line of assisting the State boards' work and filling in on the lines not taken up by the States.

Report of the council on medical education was presented by Dr. A. D. Bevan, of Chicago, who is, if possible, more enthusiastic about the work of his council than the preceding chairman of the council on health and public instruction, though the first has been at work for seven years. The council on health and public instruction has been in active existence but seven months prior to June, 1911.

The council on medical education, as shown by Dr. Bevan, has done a splendid work in preparing, from many tours of inspection and other information, charts of results in statistics regarding the improvements in medical schools during the past 10 years, and more particularly in the past 7 years. As stated by Dr. Bevan, at the present rate of progress in medical college improvement, all medical schools 8 years from now will require college or university degree prior to entrance.

Likewise it was stated that at the same rate of progress toward reduction in number of medical schools as has been in the past within 8 years there will be but 88 medical colleges each with higher

educational requirements preliminary to entrance, and as a consequence but 7,000 students should be enrolled. At the present time there are 129 colleges and over 20,000 students. With the added improvements, such as lengthened terms, donations of large amounts of money, increased facilities, laboratories, hospitals, and more salaried teachers, the following portion of the report is made important:

As to improvements which have been made in medical education, it should be said that more has been accomplished in the last 6 or 7 years than in the previous 60 years. It may not be fair to say that all has been brought about by the work of the council on medical education; nevertheless, it is clear that action taken by a national body such as the American Medical Association, representing as it does the organized medical profession of the United States, was sure to have an extensive influence. So the positive campaign carried on by your permanent committee on medical education has given impetus to a nation-wide movement for better educational standards, which, by uniting and reenforcing the activities of other agencies, has resulted in the progress which we are permitted to report to-day.

Information acquired on the council's tours of inspection and from other sources reveals that there are four States at present in which licenses to practice medicine are granted nongraduates—Tennessee, Oregon, Mississippi, and Massachusetts. Colorado was also in this class until this year.

Among many recommendations presented, it was considered very important to have teachers and educators from abroad lecture before the American Medical Association, supplementing the work of the council on medical education. A report on higher medical educational facilities abroad is expected shortly from A. Flexner, who has been studying these conditions.

Monday afternoon a public-health meeting under the auspices of the Los Angeles Chamber of Commerce was held in the Auditorium, the general public being invited, at which Col. William C. Gorgas, United States Army, delivered an address describing the work done on the canal from a sanitary standpoint. Beginning with the work of the Army board at Havana, he then took up the work on the Isthmus and described at length the methods employed to bring about the successes, giving due credit to the effect of the power and authority given the sanitarian forces throughout the Zone.

Tuesday morning the American Medical Association held its first and only general session, installing the president elect, John B. Murphy, of Chicago, who delivered an address to the medical profession and to the general public (there being several thousand present) in which he pointedly referred to many deficiencies and evils in the present-day practice of medicine, not only in the very numerous so-called cults, but in the regular profession, and made a strong plea for the assistance of the public in the study and better understanding of the practice of medicine. The indorsement of the bill for the establishment of a national health department and an

early and thorough improvement of the present pure-food law were discussed at length. The watchword or slogan of the American Medical Association, *Educate the people*, was given much consideration.

Tuesday afternoon the house of delegates met, Dr. Murphy presiding, and continued in session throughout the afternoon, acting on the following reports of committees: Special committee on scientific research, Davis memorial, nomenclature and classification of disease, scientific exhibit, anæsthesia, memorial to medical officers who died in the Civil War, establishment of a physicians' sanitarium, and national department of health.

Wednesday morning attending the section on surgery, I heard Dr. George E. Brewer, of New York, present the oration on surgery, "Some observations on ascending and hematogenous infections of the kidney," in which he summed up the results of investigation as to causation of kidney infection being due more to ascending causes (bladder infections and strictures producing patulous condition of ureteral openings into the bladder, permitting infection to reach the kidney through the ureter) than through the blood stream.

Dr. Stanton, of Schenectady, N. Y., read a paper, "Some interesting statistics on end results in gall-bladder surgery," stating that from some 350 cases observed cure is certain if all obstructions are removed at first operation, the word obstruction including adhesions; also the proper avoidance of too much mechanical injury from manipulation must be thought of as a factor in the result. Discussion was interesting. Dr. Ochsner, of Chicago, speaking for a degree of conservatism in gall-bladder surgery, more especially in any condition of acute cholecystitis without absolute evidence of stone or mechanical obstruction.

Dr. Davis, of Omaha, read a paper on factors hostile to gall-bladder operation, mentioning in particular the great distress from post-operative adhesions and the adhesions presented the greatest and most frequent factor contraindicating operation. Results in these cases had demonstrated that a cure or even an amelioration of the symptoms could not be expected.

Dr. G. G. Ross, of Philadelphia, presented a paper reporting cases of subphrenic abscess the result of acute inflammation of the vermiform appendix, the abscess in some cases having perforated the diaphragm and caused involvement of pleura and lung.

Dr. Van Buren Knott's paper, "The treatment of localized appendicular abscess," elicted some pleasant discussion as to the removal of the appendix and the thorough exploration of the region with breaking up of all adhesions advocated by him. Dr. Knott contended that with a large rubber drainage tube introduced deeply even to the rectovesical cul-de-sac the above gave best results, and

in reply to discussion stated that Sioux City, Iowa (his home), was not far from Missouri, and he would be glad to have any one come there, and assured the audience that Sioux City would be glad to "show" them. In the report 3,000 cases of appendix operation were mentioned as material for the report.

Wednesday afternoon a special meeting of the house of delegates was held for the purpose of expediting unfinished business. A telegram was sent to President Taft and to Congress indorsing action on the improvement of the pure food and drug law and the establishment of a national department of health. The following resolutions were adopted and published:

Whereas Hon. Robert L. Owen, Senator from Oklahoma, has introduced in the Senate of the United States, Senate bill No. 1, creating a department of public health for the purpose of giving the proper study to the causes of disease; and

Whereas such a department has been formally approved in the platforms of all our great political parties and by President Roosevelt and President Taft in order that our country might be placed on a plane with the other civilized nations of the world in the conservation of our greatest national asset, the health and lives of our people; and

Whereas through sinister and corrupt efforts of the patent-medicine manufacturers and those opposed to the honest administration of the pure food and drugs law, many worthy persons have been misled into believing that this great measure, designed solely for the protection of the public health and for the prevention of disease, is designed to have any jurisdiction in limiting the practice of medicine: Now, therefore, be it

Resolved, That the American Medical Association pledges its support to the principles of the Owen bill, Senate bill No. 1, creating a department of public health; that it repudiates and denounces the misrepresentation of this measure and the base slanders against the medical profession distributed through the corrupt efforts of the interests which are behind the so-called League of Medical Freedom; that it declares itself as distinctly opposed to any efforts now or hereafter by the Congresses to regulate or control the practice of medicine or to discriminate for or against any school or system of practice; and in order better to give effect to the principles herein set forth, be it further

Resolved, That the board of trustees of the council on health and public instruction, the Journal, and every other agency of this association be, and are hereby, instructed to use every honorable means to secure the passage of this measure, and that the committee on national health legislation be continued with the addition of Dr. J. B. Murphy, the president of the association, and Dr. G. B. Young, representing the United States Public Health and Marine-Hospital Service, and that this committee, acting with the council on health and public instruction, shall consider and determine all matters and policies relating to national health legislation and may invite the cooperation of and cooperate with both every State and county medical association and all other organizations having the same purpose in view.

Attending the section on surgery after the special meeting of the house of delegates a portion of a paper on experimental studies of the cause of death in acute intestinal obstruction was heard. Ex-

periments were conducted on different animals, ligating the gut, and after death by chloroform at different times after ligation using the toxins from the gut contents in endeavoring to cause death by injecting same into the peritoneum, the gut wall and the gut lumen after ligation. Little result was obtained in so far as death from infection was concerned, except when very toxic cultures of well isolated malignant bacteria were used. Dr. Maury, of Rochester, Minn., in discussion mentioned local anæsthesia as best in operation for strangulated hernia or enterotomy for relief of intestinal obstruction.

Dr. Judd, of Rochester, Minn., presented a study of 500 cases of prostatectomy, reporting very favorable results in partial prostatectomy, but in the discussion this was not concurred in by others speaking.

Dr. McArthur, of Chicago, described a new technic for rectopexy for rectal prolapse in those cases not relieved by simple methods. Practically a lateral anastomosis is made between the anterior wall of the rectum at a spot selected and the sigmoid flexure of the colon at a point well suspended.

Thursday morning, section on surgery: A paper was read by Dr. Jonas, of Omaha, on spinal fractures, declaring that in all cases with symptoms of compression laminectomy was indicated and gave good results in practically all cases.

Discussion brought out clinical results, good, bad, and indifferent. One case was reported as recovering almost completely after suturing a completely severed cord in the lumbar region. Others reported no result in the case of mild paralyses where the operation was done; again others reported a slight benefit, and others a severer condition of paralysis followed.

Dr. Gutherie, of Wilkes-Barre, Pa., reported some excellent results in fractures involving joints, showing X-ray plates of same. The function and cosmetic results were very good.

Dr. Corwin, of Pueblo, Colo., reported 30 years' experience with fractures in Minnequa Hospital, in transportation, splinting, plating and adjustment. Some observations were made on plating and requisite splinting and bandaging to prevent loosening of screws and breaking of plates.

Dr. R. T. Morris, of New York, gave a short talk on pinning fractures through a canula with the aid of a fluoroscopic screen. A fine bit of technic in selected cases.

Drs. Bartlett and Hewitt, of St. Louis, in a paper on clinical and experimental work to determine the value of Lane's plate in the treatment of fractures, compared the advantages and disadvantages of the method, and X-ray plates were exhibited; also plates of original tra tion and fixation apparatus, in a series of 60 cases.

Dr. Martin, of Philadelphia, on the open treatment of fractures, discussed the method of open treatment, and exhibited X-ray plates, but the illumination was poor and little result obtained from the explanation. Discussion of this paper as to Lane and other plates and the screws was of very considerable interest. Longitudinal strain on the plate was of little moment, but any torsion or side motion either broke the plate or loosened the screws. The material composing the plate was of importance as to acquiring the greatest degree of strength and lightness or least weight with a certain degree of elasticity in the sense of permitting a degree of bending and restoration to position without breaking.

Thursday afternoon we heard Dr. C. H. Mayo's paper on "Lingual, sublingual, and other forms of aberrant thyroid." Embryology and histology were very complete.

The final session of the house of delegates was held Thursday afternoon, for the completion of unfinished business, new business, and the election of officers for the ensuing year.

The chairman of the committee on transportation and place of session, Dr. M. L. Harris, of Illinois, reported that but one invitation had been received as to place of meeting, Atlantic City, which city was the one chosen for 1912.

Changes in the constitution and by-laws were presented by Dr. A. T. McCormick, of Kentucky, and after prolonged discussion were referred for future action. The changes were to permit the members of county as well as state medical societies to be members of the American Medical Association, and a better wording of certain portions of the constitution and by-laws to be acted on.

A resolution indorsing the bill for increase of pay of the Public Health and Marine-Hospital Service was received and referred to the legislation committee.

Election of officers resulted as follows: President, A. Jacobi, New York, N. Y.; first vice president, W. J. Barlow, Los Angeles, Cal.; second vice president, F. W. McRae, Atlanta, Ga.; third vice president, W. R. Tipton, Las Vegas, N. Mex.; fourth vice president, A. L. Wright, Carroll, Iowa; secretary, A. R. Craig, Chicago, Ill.; treasurer, W. A. Pusey, Chicago, Ill. P. Mills Jones, of San Francisco, was elected to succeed himself on the board of trustees.

Resolutions were offered and adopted extending to the local committees, particularly the committee of arrangements, Dr. H. Bert Ellis, chairman, the Chamber of Commerce, Los Angeles, and the profession of the coast, a vote of thanks and appreciation of the arrangements and care and hospitality given the visiting members of the association, their families, and friends.

Adjournment.

On Friday, June 30, 1911, the scientific and commercial exhibits were visited. Exhibits were well displayed and each commercial stand had the usual experts on hand to explain the excellent products, whether books, malted milk, instruments or surgical appliances, including corsets.

Three railway cars were parked at the central depot, each with public health exhibits, one under the American Red Cross with first-aid and other appliances, one from the California State Board of Health, and one sent by the Louisiana State Board of Health.

Many members of the American Medical Association arrived at Los Angeles, Saturday, June 24, 1911, and that night and on Sunday, June 25, 1911, many public health lectures were delivered. The Sunday lectures were given in more than twenty churches.

A great campaign of medical education for the people is well underway. Among the leaders are Dr. W. A. Evans, of Chicago, and Dr. J. N. McCormick, of Bowling Green, Ky.

During the entire week, June 26 to July 2, 1911, social entertainments, banquets, smokers, teas, receptions, picnics, tours, and even beefsteak suppers were the order of the day and night.

Hotel accommodations were ample, the climate was confortable and the profession of the State, more particularly the profession of Los Angeles, were quite indefatigable in interest and work for the success of the meeting.

SANITARY REPORT ON KIUKIANG, KIANGSE PROVINCE, CHINA.

By Asst. Surg. D. H. Noble, United States Navy.

Kiukiang, a treaty port, stands on the right bank of the Yangtse River, 12 miles above the outlet of the Poyang and 8 miles from its borders. It is 444 miles from Shanghai and 140 miles below Hankow. It was opened in 1861, having been selected on account of its proximity to the channels of inland navigation, especially those conducting to the green-tea districts of Kiangse and Anhui, and has always been a port of some consequence.

Kiukiang is a prefectural city of Kiangse Province. Its walls, 5 miles in circuit, are close to the river, and inclose the Government offices and some temples. Its principal street runs east and west and also traverses the large suburb on its western side, above which the British concession extends about 500 yards, parallel to the river, as far as the Lung Hai Ho Canal, which communicates with the lake fronting the city on that side. The British consulate occupies a central position of the bund. There are comparatively few houses now inside the walls, all of the foreigners living in the British concession and the adjacent suburb, where all business is transacted. The greater portion of the land inside the walls is cultivated. The population is estimated at 70,000.

CLIMATE.

Although it is hot from July to September, and the temperature in August frequently rises to 100°, the heat is not damp and enervating. During winter continuous bracing cold weather is experienced, with snow and frost in January and February.

In 1910 the summer and autumn were unusually hot and dry. A temperature of over 100° in the shade was registered on about 20 days and 104° on four days in August. The lowest temperature was 24°, on January 9.

The meteorological report for 1909 is as follows:

Months.	Barometer (corrected for temperature).		Thermometer (Fahrenheit).		Rainfall.	
	Maximum.	Minimum.	Maximum.	Minimum.	Amount.	Time.
					Inches.	*Hours.*
January	30.562	29.930	51	27	4.00	83.0
February	30.633	29.872	67	30	2.33	92.5
March	30.633	29.765	69	35	7.94	138.0
April	30.226	29.704	82	47	6.35	132.5
May	30.030	29.634	93	57	3.73	66.0
June	29.875	29.428	93	63	24.86	221.0
July	29.885	29.486	102	73	5.31	47.0
August	29.853	29.396	100	74	5.19	35.0
September	30.047	29.622	97	66	5.02	28.0
October	30.399	29.808	82	51	11.32	163.0
November	30.480	29.884	73	34	1.68	20.0
December	30.674	29.843	66	27	2.54	30.0

The country surrounding Kiukiang is hilly in character, with mountains in the distance, the foothills of which begin about 6 miles from the city.

The mountains, known as the Kuling Hills, rise precipitously to an elevation of 4,500 feet, and Kuling, a hill station during the hot months, having a foreign population of approximately 2,000, of which 450 are Americans, the majority being missionaries, is situated 12 miles from Kiukiang.

The current of the Yangtse River at this point is swift and the water turbid. During the summer months a lake forms to the southwest of the city and overflows, forming marshy places, favorable breeding places for mosquitoes.

There is too abundant vegetation in the foreign concession, producing favorable lurking places for mosquitoes, of which numbers belong to the sp cies *Anophelinæ*.

The only source of contamination of the river water is from a small creek which flows into the river above the foreign concession, and which receives the drainage of several hamlets above Kiukiang.

INCIDENCE OF INFECTIOUS AND TRANSMISSIBLE DISEASES.

Tuberculosis is rife in the overcrowded Chinese city and produces the highest mortality.

Syphilis, next to tuberculosis, is the most prevalent disease.

Smallpox is always present in the native city, but there have been no cases among foreign residents during the past year, who are careful to undergo periodical vaccination.

Malaria: Until one year ago the benign tertian and quartan forms of infection were fairly common and the malignant infections rare, but during the last year, owing to the building of roads, the installation of oil tanks, etc., large numbers of coolie laborers have been imported from the surrounding Provinces, and the æstivo-autumnal infections have prevailed to a considerable degree. The cerebral form has been observed in which hyperpyrexia was marked and one attack accompanied by choleraic symptoms.

Crescent bodies have been found in numbers of blood examinations in natives.

Anophelinæ mosquitoes are present in large numbers, but none of those examined have been found infected.

Typhoid fever: A few cases have been observed among natives but no cases among foreigners for three years.

Cholera has not been present in epidemic proportions for two years, but cases have been imported by steamers from Hankow, China, where the disease is present in epidemic proportions every year during the hot months.

Dysentery: A virulent bacillary type has been severe in the native city and deaths numerous, but the disease did not attack the foreign settlement. A few cases did well under rest, liquid diet, the ipecac treatment, and intestinal irrigations with saline solution.

Measles and pertussis have been present in epidemic proportions.

Relapsing fever has been present to a considerable degree.

Kala-azar: One case observed during the past year.

Bubonic plague: No cases, and dead rats examined in the foreign concession were found not to be infected with bacillus pestis. Rats were found to be infected with anthrax.

Leprosy: No cases.

Beriberi: No cases.

Elephantiasis: No cases.

Tetanus: No cases.

Scarlet fever: No cases.

Sprue: There have been several deaths among Chinese children.

FEVER WITH AN URTICARIAL RASH OCCURRING IN THE YANGTSE VALLEY AND CALLED URTICARIAL FEVER.[1]

As this disease occurs most frequently among the crews of the river gunboats, and has only recently been studied and described, the writer considers it advisable to report upon it in full:

[1] Reported also by Passed Asst. Surg. E. P. Huff, U. S. Navy, in 1909.

Definition: Urticarial fever may be defined as a possibly infectious disease of unknown origin, characterized by fever, an urticarial rash of giant proportions, involving the skin surfaces, the mucosa of the gastro-intestinal tract, also the alveoli of the lungs, and followed by a protracted convalescence.

Etiology: While the infective agent, bacterium, protozoon, or nematode remains undiscovered, there seems to be a connection between the mud of rivers, creeks, and paddy fields, and the cause of this fever. The cases occurred among sportsmen who had waded barelegged through paddy fields and the mud on the river banks. It would seem that clothing of moderate thickness acts as an effectual bar against the action of the infective agent, for sportsmen, and others who wade in the water well clad in putties or leggings seem to escape.

Incubation period: From 10 days to 2 weeks after physical contact of patient with mud of paddy fields or river.

Symptoms: For a description of the following group of symptoms, the writer is indebted to Dr. A. C. Lambert, of Kiukiang, China, who has observed a number of these cases.

Premonitory symptoms, if present, are headache and maliase, with perhaps slight cough, and an evening rise of temperature to 100° or 102° F.

In some cases there are definite gastric symptoms, vomiting, diarrhea, and epigastric pain for two or three days before the rash makes its appearance. In mild cases the rash is the first sign that the patient notices. This eruption is of an urticarial type and appears on any part of the body as a small wheal which rapidly assumes a large size, attaining frequently 3 inches to 4 inches or more in diameter. These wheals are firm, white, and raised from the surface, feeling to the touch like a solid œdema and having frequently a central pinkish area of congestion and a well-marked areola. They remain "out" for an hour or two, continuing to spread. As they disappear the central part first resumes the normal skin appearances, the areola fading last of all, so that on examination of the patient one finds the patches as large as sixpence, and sinuous, raised, red lines, the outline of former areas, some of which measure several inches in circumference.

The eruption may continue to fade and reappear for a week or more. It leaves no mark or trace behind and the patient may be practically free for many hours when it again makes its appearance with renewed vigor.

The irritability of the rash varies considerably, but taken generally is not so annoying as that of simple urticaria. When the rash is well out the patient feels better, although there may be no remission of his fever at night. The temperature is normal or but slightly

raised in the mornings. It commences to rise about noon and reaches its height, which is seldom above 102° F., about 6 in the evening, from thence gradually falling to normal, its defervescence being accompanied usually with sweating.

Diagnosis: The presence or absence of the rash has no effect upon the temperature, which may continue for days after all signs of the former have disappeared. The pulse rate is slow and in some cases below normal even when fever is present, in an average case 60 to 70 in morning and 75 to 85 at night. The effect of the disease on the respiratory passages is one of the most interesting and important, particularly important from the point of view of diagnosis, as the symptoms referable to these parts may be assigned to much more serious causes, such as tuberculosis, pneumonia, pleurisy with effusion, or empyema.

The urticarial rash frequently appears on the mucous membrane of the buccal cavity and also on that of the nose, in the latter position causing temporary impediment to respiration through the nostrils, the blockage passing off to the accompaniment of a profuse discharge of watery fluid.

The larynx may also share in the transient œdema, but never, so far as is known, to a dangerous extent, the slight embarrassment to respiration caused by the swollen mucosa soon passing off.

As far as the lungs are concerned, the principal symptom is cough, accompanied by more or less secretion. This may be distressing to the patient, coming on in paroxysms at irregular intervals, and heralded by tightness of the chest. But it is the physical signs which are apt to lead to error in diagnosis. On the first examination there may be dullness of either base and upon auscultation fine crepitant râles, resembling a pneumonia. The rash possibly has not made its appearance, but the patient does not seem ill enough for an incipient pneumonia.

The following day the rash may be out and the patch of dullness in the lungs may have entirely disappeared, the air entering freely.

After a day or two examination reveals a new area of dullness involving perhaps the whole of one lung. The breath sounds are distant and fine crepitations again heard. The respiratory rate is not, however, increased to the extent to which one would expect from the physical signs. A day or two later, upon examination, the involved lung may have cleared up, and the opposite lung is dull and apparently not admitting air. This goes on from day to day to the discomfort of the patient, in spite of treatment. Examination of sputum has thrown no light on the ætiology. In some cases the symptoms are distinctly more gastric and intestinal than pulmonary.

All types suffer from anorexia and furred tongue, but in the gastric form diarrhea and vomiting are more marked, and epigastric pain is complained of.

In the intestinal form the symptoms are of a dysenteric type, with the passage of frequent but not very painful stools, composed in large part of honey-colored mucus and blood.

A steadily increasing eosinophilia is encountered from the commencement which in one case reached the high degree of 40 per cent, and gradually disappears as health is regained.

Duration of this type of fever varies considerably. In the milder attacks the fever has disappeared at the end of a week or 10 days and normal health regained at the end of a month. In the severer types, where fever lasts from three weeks to a month, normal health may not be regained for two or three months.

Prognosis: In the vast majority of cases, while there is a good deal of prostration and a protracted convalescence, treatment ends in complete recovery.

Treatment: In the acute stage this is unsatisfactory. Most cases are, however, benefited by salines and small doses of calomel. Quinine seems to have little effect on the early temperature, but later, when it is commencing to fall, it seems to be as good a drug as is available. Salol is disappointing. Santonin is used without effect. During convalesence, generous diet, tonics, arsenic, and cod-liver oil are indicated, while change of air, if it can be arranged, is a great help.

Prophylaxis: Sportsmen and others who wade in the water of paddy fields or rivers should be well clad in putties or leggings, as clothing of moderate thickness seems to act as an effectual bar against the action of the infective agent.

PARASITIC INFECTIONS.

Ankylostoma and ascaris lumbricoides infections are common among the laborers in the fields.

The most important, however, is infection with the fatal variety of fluke worm *Schistosomum japonicum*. Two foreigners at Kuling, Kiangse Province, have been found infected with this worm. The infection was probably contracted at Changsha, Hunan Province, China, where these men formerly resided.

The symptoms are the formation of a chronic peritonitis, later ascites, enlargement of the liver and spleen, and blood-streaked stools; later on emaciation; at first hæmoglobin is 75 per cent. Eosinophilia is not marked. All treatment is unavailing, and the infection goes on to a fatal termination.

An interesting fact is that all of the hunting dogs, setters, pointers, etc., belonging to foreign residents, upon examination, have been found to be infected with *Schistosomum japonicum*.

WATER SUPPLY.

The water for drinking purposes in the foreign concession comes from the river, and is carried by coolies to the residences, there being no system of piping. This water is soft, and after precipitation clear. It is then boiled and filtered, and as a result good drinking water is obtained. There are a number of wells throughout the city, but the water draining from the surface, as many do, is infected with bacteria. This is generally recognized, and well water is used only for washing purposes.

SEWERAGE.

The foreign concession have cement modern, open-work sewers to carry off the rainfall, which empty into the river.

Feces and urine are collected in metal receptacles placed in concrete vaults and removed daily from the concession.

In the native city feces and urine are collected in concrete vaults, earthen jars, etc., and sold to the soil merchant.

HOSPITALS.

St. Vincent's, under the management of Catholic Sisters, has accommodations for 50 charity patients and accommodations for seven foreign patients, and is situated two squares from the water front in the foreign concession.

The hospital for foreign patients is a two-story building, built of brick and concrete. Dr. Alexander C. Lambert is the physician in charge of the medical and surgical work, assisted by three Catholic Sisters as nurses. The sister superior in charge was formerly in the Shanghai General Hospital and speaks English.

Foreign wards, first class, two rooms and bath and capable of accommodating four patients. Second-class ward, three beds, taels per diem. Second-class ward, four beds, 3 taels per diem.

Medical attendance, surgical operations, and special nurses are not included in the above rates, but must be arranged for separately. The quantity and quality of food is as good as a Chinese city provides, but proper diet can be obtained. These wards are available for patients landed from American gunboats.

The heating is by stoves, the lighting by oil lamps, and ventilation by means of windows and transoms. The hospital for foreign patients was completed in 1910. The operating room is small, but there is a full supply of surgical instruments. A modern steam ster-

lizer has not been installed, but is under consideration, and until this is done it is not certain that absolute asepsis can be secured; therefore the performing of major operations is not advised except in cases of emergency. There is a full supply of drugs, serums, etc.

There is a hospital for women and children known as the Elizabeth Shelton Danforth Memorial Hospital, under the control of the American Methodist Episcopal Church. Dr. Mary Stone, Chinese, graduate of the medical department of the University of Michigan, is in charge, assisted by 15 female Chinese nurses.

This hospital is located in the center of the walled city, is two stories in height, built of brick and concrete, and has two wings fronted by sun parlors. There are 14 private rooms, which can be used for more than one patient if necessary. There are five wards. The regular capacity of the hospital is about 100 beds. However, the capacity can be much increased by placing more beds in the private rooms and more beds in the wards.

Work is strictly beneficent. It is only for women and children. Most of the work is charity work done in the interest of missionary enterprise. Male patients can not be accommodated.

Surgical work is not particularly attempted because if the operation results in death the Chinese attribute the unfavorable results to the operation. If the work is very successful they greatly praise the foreign doctors.

Heating is by stoves, burning wood and coal. Ventilating is by windows and transoms. Lighting is by lamps, burning illuminating oil. This hospital was three-fifths completed in 1900 and entirely completed as it now stands in 1907. There is an isolation ward, however, not very far removed from the main structure.

During the fiscal year ended June 30, 1910, 615 bed patients were treated. A total of 15,000 patients were treated during this period, the most prevalent diseases being malaria, tuberculosis, and syphilis.

This hospital is excellently equipped to carry out the charitable medical work among the poor and suffering women and children of Kiukiang and vicinity.

The usual sanitary precautions for the Tropics, under the jurisdiction of the customs surgeon, are observed by those living in the foreign concession.

There are no national, state, or municipal laws relating to quarantine, except within limits of the customs officials.

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